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EIGHTH REPORT

OF THE

STATE BOARD OF HEALTH

OF THE

STATE OF MAINE

FOR THE

Two Years Ending December 31, 1893

1892 - 1893

AUGUSTA
BURLEIGH & FLYNT, PRINTERS TO THE STATE
1895

MAINE STATE BOARD OF HEALTH.

OFFICE OF THE SECRETARY,
AUGUSTA, ME., 1894.

To His Excellency, Henry B. Cleaves, Governor, and the Honorable Executive Council:

GENTLEMEN:—I have the honor of submitting to you the Eighth Report of the State Board of Health of Maine, it being the First Biennial Report and for the years 1892 and 1893.

Very respectfully,

A. G. YOUNG, M. D.,

Secretary.

MEMBERS OF THE BOARD — 1892.

E. C. Jordan, C. E., *President*, Portland.
O. A. Horr, M. D., Lewiston.
Prof. F. C. Robinson, Brunswick.
Charles D. Smith, M. D., Portland.
Hugh R. Chaplin, Esq., Bangor.
A. R. G. Smith, M. D., North Whitefield.
A. G. Young, M. D., *Secretary*, Augusta.

MEMBERS OF THE BOARD — 1893.

Charles D. Smith, M. D., *President*, Portland.
O. A. Horr, M. D., Lewiston.
E. C. Jordan, C. E., Portland.
Prof. F. C. Robinson, Brunswick.
A. R. G. Smith, M. D., North Whitefield.
G. M. Woodcock, M. D., Bangor.
A. G. Young, M. D., *Secretary*, Augusta.

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INTRODUCTORY.

The present sanitary organization of our State, as compared with that of any other state is creditable to the Commonwealth. The law prescribes that "there shall be a local board of health in each city and town in this State, to be composed of three members." Anticipating by a year the time covered by this report, during the years 1893 and 1894, of the 20 cities, 415 towns, and 79 plantations, reports have been received of the organization of a board in every city, in all but eight towns, and in all but twenty-two of the plantations. The quality of the work done by these local boards varies from excellent to next to worthless, the fault for the latter grade of work resting partly upon the character of the persons composing the local boards; partly on the want of appreciation by the appointing municipal officers of the value to our State and to each town, of cleanliness and the absence of epidemic diseases and a well-deserved reputation for healthfulness; and partly the fault rests with the people who fail to insist that serious public nuisances and other dangers shall not exist when their removable is practicable.

An examination of the abstracts from the reports of local boards of health in this volume should convince an impartial enquirer, that the aggregate of sanitary work and sanitary watchfulness done by these boards is of inestimable value.

But if the sanitary organization of the State places her well to the front, these local boards are hampered in their usefulness by working under public health laws which, in some directions, are far inferior to those of many other states. In fact, most of the work of the local boards, other than that of restricting the infectious diseases, is done under one short section of an antiquated law, viz.: Section 16 of chapter 14, Revised Statutes. There are many directions in which local boards of health in other states stand between their citizens and impending dangers, not recognized

in the law of our State, or, if so, in no useful way. Laws of this kind should clearly prescribe the duties of those to whom they relate, even though this requires a somewhat detailed statement. Public health laws which provide for things in a general way are often next to worthless.

In accordance with the provisions of the law that the State Board of Health shall make "such suggestions as to legislative action as they may deem necessary," a bill will be presented for an act defining more clearly the powers and duties of local boards of health in some directions, and providing more fully for the protection of the public health.

The lines of work carried on by the State Board of Health, now, as in the past, consist in directing and co-ordinating the public health work of the State, in advising and assisting local boards of health, and it will, under the authority granted in chapter 305, Laws of 1893, act for the protection of the public health should emergencies occur such as are contemplated in that law.

One kind of work, that upon which all successful public health work must be based, has not been neglected,—that is, teaching that many of the diseases which afflict us are preventable, and that it pays financially and otherwise to prevent them. During the year 1893 one aim of the Board was to put a copy of "Circular 54. The Prevention of Consumption," into every home in the State, Though the desired end was not quite reached, this leaflet had a very wide distribution through the hands of local boards of health, clergymen, and other persons.

Since it is satisfactorily determined that tuberculosis is a communicable disease, there is an urgent call from public health officers over all our land for legislative provisions to aid them in preventing its spread. There is almost a unanimity among these sanitary authorities that it is at present advisable to go no farther than to advise their respective legislative bodies to provide that cases of tuberculosis of the lungs, or consumption, shall be reported to local boards of health, and through local boards to the State Board. The existence and the location of cases of this disease may thus be known, and it will then be possible for health officers to assure themselves that the patient and his attendants and associates are informed as to the way in which the disease is usually spread, and that they are instructed as to the few simple precautions against

infection which are in the interest of both the sick and those about him.

The reception accorded the Seventh Annual Report, three hundred pages of which were given to "School Hygiene and School Houses," has been very gratifying to the Board. Not only from the citizens of our own State have many kind words of appreciation been received, but from public health officers, departments of education, chairs of pedagogy, principals of high and normal schools, directors of departments of physical culture, and educational and sanitary journals all over the country, and to some extent abroad, words of commendation have been received.

SECRETARY'S REPORT.

The names and addresses of the Board at the end of the year 1892, with the dates of expiration of their terms of office were as follows:

E. C. Jordan, C. E., Portland, term expiring January 31, 1893.

O. A. Horr, M. D., Lewiston, term expiring January 31, 1894.

Prof. F. C. Robinson, Brunswick, term expiring January 31, 1895.

Hugh R. Chaplin, Esq., Bangor, term expiring January 31, 1896.

Chas. D. Smith, M. D., Portland, term expiring January 31, 1897.

A. R. G. Smith, M. D., North Whitefield, term expiring January 31, 1898.

At the annual meeting of the Board, March 28, 1892, E. C. Jordan, C. E., was unanimously elected President for the ensuing year. The committees remained the same as in the year 1891.

In December, 1892, A. R. G. Smith, M. D., was appointed by the Governor to fill the vacancy due to the expiration of the term of office of Dr. Webster early in the year, Dr. Webster, meanwhile, having removed to California. In March, 1893, Dr. G. M. Woodcock was appointed to fill the unexpired term of Mr. Chaplin, resigned.

In the following June, the Board was called to mourn the loss by death of one of its oldest and much esteemed members, Dr. O. A. Horr of Lewiston. The vacancy thus caused was filled in January, 1894, by the appointment of Dr. M. C. Wedgewood of the same city.

At the meeting in June, 1893, the following was passed:

"Our late associate and member, Dr. O. A. Horr of Lewiston, held the respect and esteem of this Board for the interest he showed

in its steady progress along the lines of advanced sanitary science, as well as for his faithful services to the same. To serve without compensation, giving freely of time, strength, and enthusiasm to the cause, is generosity not easily to be commanded, and our State is indebted to busy professional men who render as cheerfully and zealously as did Dr. Horr their aid and coöperation in the work. The members of the Maine State Board of Health here record their appreciation of their friend so lately in their midst, as regards his high personal character and fidelity to duty and his qualifications for the office he here held. Feeling the inadequacy of resolutions to express the loss which the State and this Board experienced in his death, I would simply move that this acknowledgment be placed upon our record and copies be sent to his family as a token of our sympathy in their bereavement, and be also forwarded to the Governor and Council of this State."

The personnel of the Board, therefore, at the end of the year 1893, was as follows:

Vacancy by the death of Dr. Horr, term ending Jan. 31, 1894.

Prof. F. C. Robinson, Brunswick, term ending Jan. 31, 1895.

G. M. Woodcook, M. D., Bangor, term ending Jan. 31, 1896.

Charles D. Smith, M. D., Portland, term ending Jan. 31, 1897.

A. R. G. Smith, M. D., No. Whitefield, term ending Jan. 31, 1898.

E. C. Jordan, C. E., Portland, term ending Jan. 31, 1899.

At the annual meeting of March 27, 1893, Charles D. Smith, M. D., was elected president for that year.

The following committees were appointed for the year 1893.

Finance—A. R. G. Smith, E. C. Jordan, and the Secretary.

Circulars and Other Publications—A. R. G. Smith, G. M. Woodcook, and the Secretary.

Sewerage and Drainage and Disposal of Excreta—E. C. Jordan, F. C. Robinson, and C. D. Smith.

Ventilation—O. A. Horr, E. C. Jordan, and the Secretary.

Summer Resorts—E. C. Jordan and the Secretary.

Water and Water Supplies—F. C. Robinson, E. C. Jordan, O. A. Horr, and the Secretary.

School Houses and School Hygiene—F. C. Robinson and the Secretary.

Sources of Animal Vaccine—C. D. Smith.

Quarantine—C. D. Smith, G. M. Woodcook, and the Secretary.

Cholera.—The disease which was the source of the greatest solicitude to the Board was Asiatic Cholera. In 1892 the severe cholera epidemic raged in Hamburg, and serious outbreaks occurred at many other European points. The following year the disease was again very widely spread over Europe,—Russia, Austria, Hungary, and France suffering severely, while in Germany, the Netherlands, and Belgium it was less prevalent. Cases occurred also in Italy and Spain, and cholera was brought to the English ports repeatedly. In both years cholera came to the port of New York; in 1892, after the occurrence of a large number of cholera cases, scattered cases were found in the city, but thanks to the prompt and energetic action of the municipal board, the malady failed to establish itself.

This Board strove to put the State into the best possible condition to ward off the danger and to resist infection should it come. Local boards were warned of the danger and urged to secure sanitary improvements, and to be on the alert. In the *Sanitary Inspector* for June, 1892, the attention of the local boards and municipal governments was called to the danger in these words:

"For some months the cholera prospect has not been reassuring, and, at the present writing, the danger of the importation of the disease into this country the present season is becoming more imminent. The old story of the march of cholera through Russia into other European countries, of equivocation of Muscovite officials, instead of frank avowal and neighborly warnings, and of red tapery, seems to be working itself out again. Meanwhile local boards of health, municipal governments, and citizens generally should raise an effective barrier against the implantation of the infection upon our soil by municipal and private cleanliness.

"Though disaster has in the past come to some of our cities from this pest, Maine has many times been fortunate; but we are now more closely connected with the rest of the world than ever before, and where travel and traffic go, cholera is wont to go, if it is permitted. There are places in this State where typhoid fever has been more prevalent than it should have been. Cholera is closely related to typhoid fever, and the conditions that favor the prevalence of the one disease, favor the spread of the other. For the citizens or the municipality to guard against either disease, the first desideratum is a water supply above suspicion; the next is an

approved system of excreta-disposal. Let every town do creditable work, which, if cholera comes, will be fortunate; if it does not reach us, will be a blessing as a bar to typhoid fever and some other diseases that are greater scourges than cholera."

Knowing well the advantage of railway sanitation in the prevention of the spread of such a disease as cholera, if it should be introduced, a circular letter was sent to all the railway companies operating lines in this State, calling their attention to the fact of the serious danger from cholera; that when cholera prevails many cases of the disease do not assume a typical form but present the symptoms of an ordinary diarrhœa; that persons affected with the disease in this form may be all unconscious of the nature of their trouble, or may conceal from quarantine officials the fact of their illness; that cases of this kind are really the most dangerous to the public, and that these cases are sometimes fateful factors in starting epidemics, for the reason that they are often unrecognized; that it is well known that the stools of persons sick with cholera contain the specific infection of the disease, and that this infection, under favoring circumstances, may be preserved some time, and even multiply after its dejection from the patient; that places highly favorable to the preservation of the infection are ill-kept water-closets, privy vaults, etc.

An urgent appeal was therefore made that all railway outbuildings and water-closets be kept in the best possible condition of cleanliness. In the letter reference was made to "Circular 66, Sanitary Improvements: Hints as to Some Means and Methods," which was sent to the railway officials, and which is reproduced upon another page.

From the principal railways, an answer was very soon received assuring the Board of their cordial willingness to coöperate in this work, and orders were issued to employes that they would be held strictly responsible for the sanitary condition of stations and cars.

A revised edition of Circular No. 21, "Practical Facts about Cholera," was also prepared and sent to the local boards and otherwise distributed. Later in the season the following special circular was sent to the local board in every city, town, and plantation:

OFFICE OF STATE BOARD OF HEALTH,
AUGUSTA, September 16, 1892.

To Local Boards of Health:

Through the columns of the *Sanitary Inspector* you were some time ago reminded of the danger from Asiatic cholera and warned to be prepared for it. Each local board of health has also received sample copies of "Practical Facts about Cholera." Since then the danger has drawn much closer to us and the need is urgent for local boards of health to be prepared in case of an emergency to do what should be done and to do it quickly. Each board will be expected:

1. If it has not lately held a meeting, to do so at once, for the purpose of choosing officers for the ensuing year if this has not been done, and for deciding just what shall be done if a case of cholera should appear in your town.

2. If there are vacancies in your board, to apply to the municipal officers to fill them at once. If this is not done soon, inform this office. Meanwhile bear in mind that each member holds his position until his successor is appointed.

3. To take measures for putting your town into the best sanitary condition as soon as possible. In this work have in mind the ways in which cholera is spread. (See cholera circular.) (a.) Water supplies must be preserved from pollution, because polluted water supplies are particularly liable to infection. (b.) Places in which filth is stored are well fitted for the rapid multiplication of the specific infection of cholera. Such places must therefore receive immediate attention, particularly the privies, water-closets, and urinals in public places,—manufactories, schools, hotels, and railway stations.

4. If a case of cholera or a suspected case occurs, to (a) quarantine it at once; (b) notify the State Board by telegraph; (c) prevent the formation of points of infection. Points of infection are established by permitting things soiled with the vomited matter or the discharges from the bowels to remain unburned or otherwise not disinfected; or by having the matter from the stomach or bowels discharged or thrown into privies, upon manure heaps, or upon the surface of the ground, particularly about inhabitated places.

5. If bedding, clothing, floors, privy vaults or other places near dwellings, or where there is danger of soakage into wells or other sources of water supply, are infected with cholera discharges, to disinfect these things or places at once and thoroughly.

As disinfectants use chloride of lime, carbolic acid, heat, and caustic lime.

Chloride of Lime. (Sol. A.) For vomited matter and discharges from the bowels, and for privies and all places out-of-doors suspected of being infected.

Carbolic Acid. (Sol. E.) For indoor disinfection generally, for clothing, for soiled places on floors, etc.

Heat in burning infected mattresses, carpets, and all things that cannot surely be disinfected otherwise, and in boiling or steaming clothing and bedding.

Caustic Lime, in the form of "milk of lime," as a substitute for chloride of lime. It should be prepared just as common whitewash is prepared from unslacked lime.

We trust that not a case of cholera will reach our State, but there is danger and we must be ready for it.

Order all necessary supplies from "Reference List."

Respectfully,

A. G. YOUNG, *Secretary.*

At a meeting of the Board in December, 1892, the Secretary stated that last September he had made application to Surgeon-General Wyman of the Maine Hospital Service, for the services of an expert from his department to determine biologically the existence or non-existence of Asiatic cholera in this State, if an outbreak or a case should occur suspected to be Asiatic cholera. In addition to the favorable assurances of the Surgeon-General, it was thought prudent to make arrangements with some competent bacteriologist nearer home, in case aid from the National Bureau should not be available at once if needed the coming season, and the Secretary was instructed to do so. Arrangements were, therefore, made with Prof. Ernst, of Harvard University, to act in this capacity, if called upon.

Early in September, grounds appeared to exist for the apprehension of the danger of the introduction of cholera contagion into the State by the way of Halifax, N. S., and St. John, N. B. Dr. Charles D. Smith, as the representative of this Board, visited those two provincial ports, September, 1892, in company with the committee appointed by the National Conference of State Boards of Health, to examine the inspection and quarantine arrangements at all the North American ports of entry.

A special meeting of the State Board of Health was held September 14, 1892. At this meeting Dr. Smith reported the results of his inspection of the arrangements at these two points. At Halifax matters were found in a fairly good condition, but he did not think the officials and their facilities for work at St. John and other New Brunswick ports were trustworthy at all.

The discussion of the impending danger from cholera brought out strongly the opinion of the Board that there should be a uni-

fied system of national quarantine. The present system of quarantine throws upon a few seaport towns an inequitable burden of expense for the protection of the whole interior of our country, as well as for their own safety. Portland, for instance, has equipped her port at considerable expense with a disinfecting plant, and provides a service for the inspection of immigrants, most of whom are going West.

The danger of the introduction of cholera through some of our smaller ports was discussed. The Secretary reported that, early in the fall, he had sent a letter of enquiry to the executive officers of the local boards of health of all shipping ports on our coast asking whether any local quarantine rules and regulations were in existence, enclosing at the same time a copy of those adopted by the local board of health of Portland in 1891.

The regulations in force at Portland are as follows:

From and after this date (November 28, 1891) the following rules and charges will be enforced at this port:

I. All vessels arriving at this port with plague, cholera, smallpox, yellow fever, typhus fever or other contagious disease on board, or having had the same during the voyage, must be directed by the pilot or harbor master to anchor on quarantine ground and remain there until released by written order of the Board.

II. Any vessel arriving from a foreign port, with or without sickness on board, and not having a clean bill of health from consular officer at port of clearance, will be directed by the pilot or harbor master to anchor at quarantine and remain until released by written order of the Board.

III. All vessels or steamships arriving from European or Asiatic ports will be compelled to anchor at quarantine and remain until inspected under direction of, and released by written order of, the Board; unless special permission shall be given in writing to allow any such vessel to come to its wharf for inspection there, in which case no person shall enter or leave the vessel until permitted by written order of the Board.

IV. Inspection will be made promptly as soon as notice of arrival shall be received, but only during the hours of daylight, or from 8 A. M. to 6 P. M. and the charges shall be as follows, to wit:—

For each sailing vessel, five dollars ($5.00.)

For each steamship carrying freight only, ten dollars ($10.00.)

For each steamship carrying passengers, fifteen dollars ($15.00.)

In all cases the quarantine officer making the inspection shall collect the charges made against any vessel either in currency or captain's draft on consignee, and account for the same to the Board. (Dated December 4, 1891.)

In the evening of September 14, in accordance with a previous arrangement, there was a conference of the State Board of Health with the Governor and Executive Council as to the measures to be taken in view of the danger from cholera and as to whether the Board should make expenditures in excess of its yearly appropriation, if it should be necessary to do so. At the conclusion of the conference it was ordered by the Council, that "the State Board of Health are hereby instructed to use every available means in their power to protect the citizens of this State against the cholera and every other epidemic." Fortunately, however, the approach of cholera was not nearer than New York harbor, and the expenditures of the Board did not exceed the annual appropriation.

In the latter part of November, 1892, the local board of health of Rangeley was notified by the attending physician of a case of Asiatic cholera in that town. The local board of health notified the State Board. An investigation was made on the ground by Dr. Horr, late member of this Board. The case eventuated in recovery. Dr. Horr found that the patient, a woman, had not been from home, nor had her husband or children. Nobody from outside the sparsely settled neighborhood had been there. To nothing which she had eaten, could the woman attribute her sickness. Neither the attending physician, the patient, nor any body with whom Dr. Horr conversed could suggest any possible means by which the patient could have been exposed to the contagion of Asiatic cholera nor could the doctor conjecture how such exposure could have existed. The conclusions of Dr. Horr were that there were no grounds for believing the case to be one of Asiatic cholera. In his opinion it was a case of cholera morbus.

During the two years a standing arrangement has existed whereby this Board is notified by the Commissioner of Immigration of the ports of New York and Boston of the arrival at those ports of immigrants affected with infectious diseases or exposed to such, and destined to any place in Maine. When such notifications are received, the executive officer of the local board of health of the town which is the destination of such suspicious immigrants is immediately notified and advised.

Small-Pox and Vaccination—In 1893, especially the latter part of the year, and extending into 1894, time not covered by this report, small-pox showed a remarkable tendency to spread.

In other states some serious epidemics occurred and the infection of the disease was wide spread. The cause of this was undoubtedly due in all cases to the neglect of vaccination. In Reading, Berks County, Pennsylvania, an outbreak of small-pox became an epidemic of serious proportions and persisted a long time, apparently due to the fact that an ignorant mining population was opposed to vaccination. Though exposed to greater danger than in ordinary years we *happened* to have only one outbreak in 1892 of four cases and two in 1893 with one and two cases respectively.

Our comparative immunity from small-pox has been merely good luck, rather than due to a faithful employment of a means of protection, which, if generally used, is almost unfailing,—vaccination and revaccination. In many of the towns in this State vaccination has been shamefully neglected, thereby presenting an inviting field for the rapid spread of small-pox, if the contagion of that disease should be introduced to it.

Recognizing the serious import of this negligence, some of the members of the Legislature of 1893, were instrumental in introducing a bill for a legislative remedy for this evil. The primary motive of the originator of the measure was a financial one,—to diminish the loss from deaths under life insurance. This, which is an example of the customary policy of this class of level-headed business men, should incite the local guardians of municipal welfare to insist that public vaccination be not neglected.

The law of the last legislature takes the matter of vaccination from the hands of the municipal officers and puts it into those of the local boards of health, making the providing of vaccination obligatory. The law is given upon a following page.

Since the law provides that the State Board of Health "shall have general oversight and direction of the enforcement of the statutes respecting the preservation of health," it became the duty of the Board to remind the local boards of their duty under the new vaccination law, and to aid them so far as was needful in complying with its provisions. The following circular letter was therefore sent from the office of the Secretary:

OFFICE OF THE STATE BOARD OF HEALTH,
AUGUSTA, ME., Dec. 22, 1893.

DEAR SIR:—This is sent to you for the purpose of calling your attention, in a special manner, to Chapter 172, Laws of 1893, which provides as follows:

The board of health of each city, village, town and plantation shall annually, on the first day of March, or oftener if they deem it prudent, provide for the free vaccination with the cow pox of all the inhabitants over two years of age within their respective localities, to be done under the care of skilled practising physicians, and under such circumstances and restrictions as said authorities adopt therefor."

It will be observed that the matter of providing, or of not doing so, is not left discretionary with local boards of health, except so far as concerns the question of vaccinating at shorter intervals than once a year; but it is obligatory with local boards to provide for free vaccination at least once every year.

In the opinion of the State Board of Health it is very important that there be a strict compliance with the provisions of this act. An unvaccinated community is constantly in danger of an expensive and life-destroying outbreak of small-pox as the result of a chance introduction of its contagion. In the past, there have been too many disastrous small-pox outbreaks due to the neglect of vaccination. Of late years our comparative exemption has been simply good luck—merely a matter of chance.

Questions relating to this duty of local boards of health will gladly be answered by this office.

I enclose circulars No. 26 and No. 27. These can be had in quantity by applying for them.

By order of the State Board of Health,

A. G. YOUNG, *Secretary.*

Later the many enquiries received in this office necessitated a large number of personal letters in reply. The following was also sent to each local board:

OFFICE OF THE STATE BOARD OF HEALTH,
AUGUSTA, ME., February 15, 1894.

DEAR SIR:—This is sent in answer to questions frequently received.

The State does not furnish vaccine virus for the free vaccination which Chapter 172, Laws of 1893, makes it the duty of local boards of health to provide. Each town in which vaccination is done must pay the bills for the vaccine virus ordered by its local board of health, or furnished by the physician who does the vaccination.

Vaccine crusts should not be used. The lymph preserved on glass or ivory points is the most desirable form to use.

To local boards of health, the usual price of points is $6.00 or $7.00 a hundred when 100 or more are ordered at once.

As to the place whence vaccine lymph may be obtained, instructions will be sent by personal letter to those who need the information.

The law simply makes it the duty of the local board of health to provide and to offer free vaccination, but authorizes neither the board nor its agents to vaccinate a person against his will.

The board should, however, urge the need of vaccination and seek to furnish the people with trustworthy information about the subject. For this purpose a free distribution of Circulars No. 26 and No. 27 should be made. They can be had from this office for the asking. In matters of this kind the press can render efficient aid, and local papers should be asked to remind their readers of the importance of attending to vaccination.

The physician or physicians employed by the board may make a house to house vaccination. By so doing a much larger number of persons will receive the benefit of the vaccination. Or at stated times and places, to be announced in advance, the physician may be present to vaccinate. This method will not give so good results, but will cost less.

Or, the house to house vaccination may, this year, extend to only a portion of the more thinly settled parts of the town, and, in the villages at the same time, vaccination may be offered at the physician's office or elsewhere. Local conditions should influence the choice of method, the aim being to secure for the whole town ample protection from the danger of small-pox as soon as is practicable.

The offer of free vaccination should be open to all, irrespective of social condition. The well-to-do have a right to it, and the poor should not be made to feel that it is a charity, or for them alone.

In the opinion of the attorney-general, "A town is under legal obligation to pay the bills contracted by its local board of health in the performance of its duties under Chapter 172 of the public laws of 1893, and that such local board of health has power, at the time of employing physicians to perform the services named in said chapter, to fix their compensation for the same."

Respectfully,

A. G. Young, *Secretary.*

Typhoid Fever in Ashland—In the summer and fall of 1892 a serious outbreak of typhoid fever occurred in the village of Ashland. At the instance of the State Board, Dr. D. G. Luce of Caribou visited the place in the early part of September and made an investigation. His clearly drawn report indicated pretty conclusively that the cause of the fever was referable to certain wells in the village. The secretary of the local board was advised urgently to insist that no water from suspected wells be drank unboiled, nevertheless cases continued to occur. The Secretary of this Board personally visited the place some weeks later, arriving in the village October 8. The house to house enquiry which was thereupon made included the name and age of the person who had suffered from the fever; possible relation or dependence upon other cases of typhoid fever;

where the person was during the two or three weeks before the fever attack; water supply both customary and occasional; the milk supply; the sanitary condition of the residence.

The enquiry soon made it apparent that a common cause of the outbreak was not to be sought in the milk supply, for nearly every family had milk from its own cows.

The character of the strata through which the wells in all the village have been sunk subjects them to great danger of pollution from any accumulations of filth upon the surface of the ground, as sink-drainage, privy vaults, barnyards, etc. There is in no place more than a very few feet of soil overlying a ledge largely of limestone formation. This ledge is extremely loose in texture, full of crevices, and therefore very permeable to the downward soaking surface drainage. So "shelly" is this ledge that, when uncovered, an excavation may be made into it, for a considerable depth in some places, with pick and crowbar.

The history of the outbreak pointed strongly to one particular well as having played the major part in the harm which had been done; but there are reasons to regard other wells with suspicion. Six wells and their surroundings were personally examined, from which samples of water were afterward collected and examined chemically.

Well No. 1 was across the street from the village school, and on the premises where, the year before, there had been a case of typhoid fever from which the discharges went into the privy vault during the first week of illness. The privy was only twenty feet distant from the well, had not been often cleaned and with a present considerable accumulation. The land descends from the well to the privy, but the depth of the well makes this fact void of significance. The "old oaken bucket" hung in the well. Other possible sources of pollution were the stable, six feet, and the sink drainage, fifty feet distant. The well had been dug four or five feet to the ledge, then the excavation was carried through the shelly ledge to a depth of twenty-two feet, then it was drilled to a total depth of forty-four and a half feet. The shape of the excavation therefore resembled somewhat a tunnel for the collection of the surface drainage in its vicinity.

Well No. 2 was twenty-five feet deep, twenty feet distant from the privy, four feet from a hotel stable, thirty feet from the barn-

yard, and ten feet from the pig pen. The surroundings were not in a sanitary condition.

Well No. 3 was sixteen feet deep. The distance of the privy from it was twenty feet, of the stable, sixty feet, pig pen, forty, sink drainage, fifteen feet. The well was dug through three feet of soil and then thirteen feet into the ledge. The sink drain was leaky and the privy was in bad condition.

Well No. 4 was sixty feet deep and drilled all the way through the loose ledge. The privy was thirty feet distant, the stable, twenty-eight feet, sink drainage, eighteen feet. The condition of the surroundings was bad. The water had been offensive to taste and smell.

Well No. 5 was fifty-two feet deep, was excavated seven feet through the soil and forty-five feet into the ledge. Its distance from the privy was twelve feet, from the stable, fifty feet, from a cesspool, thirty-five feet. It is said that in summer the water tastes bad and smells bad.

Well No. 6 is seventeen feet deep, passing down through six feet of soil and eleven feet of rock. This well is said to furnish "good cold water," but the privy is sixty-eight feet distant with the surrounding ground filthy and soggy and otherwise in bad condition. The barnyard and pigpen are 110 feet, and sink drainage ninety-eight feet distant. Two cases of typhoid fever occurred on the premises the year before.

So far as they appear to throw light upon the cause of the outbreak, the following are the more important facts in connection with the history of the different cases of typhoid fever.

Case A. A girl of eleven, attacked August 17. At home the water supply is from an aqueduct, the source of which would not be likely to be polluted. The sanitary surroundings were not of the best. Drank water from well No. 1 while at the school picnic August 6.

Case B. A young lady of seventeen years of age. Attacked August 20. Water supply at home apparently good and no probability of contamination. Saw a schoolmate sick with fever two days before her own attack. Sanitary condition of home excellent. Had attended village school, carried her dinner, and drank water from well No. 1.

Case C. A girl eight years old. Took her bed September 1. She went to school a few days during the two or three weeks before

her attack and was at the picnic August 6. She also drank water from well No. 1, August 21.

Case D. Mrs. D. was attacked August 14. She had been home all summer and used water from well No. 1, which was on her own premises.

Case E. Was of a child two and a half years old. She had been home all summer and used water from well No. 1, which was nearly opposite her residence. The physician called August 9, found her to have typhoid fever. She had then been ailing several days.

Case F. A boy seven years old. Date of attack about August 1st. Attended school until its close early in August, and had played about well No. 1 and drank water from it. In playing about the village he had also drank water from other wells. There had been a case of typhoid fever in his home four years ago.

Case G. A boy nine years of age. He was attacked August 21. Attended school and drank water from well No. 1. At home, had water from well No. 4.

Case H. Mrs. H. was thirty-eight years of age and lived in the same house with Case G. She drank water from well No. 4 only. She did not wash the clothing of Case G. She was attacked with fever September 16 and died October 3.

Case I. Was a girl of six years. She attended the village school until its close August 6th and drank water from well No. 1. At home she drank water from well No. 3, on the premises. She was attacked August 16th.

Case J. A man forty years of age, the father of the girl whose sickness formed Case I. He became sick September 19th. I could not learn whether he had drank water other than that from his own well, No. 3.

Case K. The hired man in a family, twenty-two years of age. He had come to this house in July, ailing when he came. His was a "walking case" of typhoid fever.

Case L. A girl eight years old in the same house with Case K. She attended the village school until its close and undoubtedly drank water from well No. 1, which was the customary supply for the school. But while sick the hired man lay much of the time upon a lounge in the living room, which lounge was often occupied by the child when she came in tired from her play. She became sick the latter part of August.

Case M. Was that of a young lady of sixteen, who had been teaching away from home in a neighboring town, coming home every Friday evening. There had been no cases of typhoid fever in or near the place where she was teaching. Her school had a vacation the first three weeks in July, and while at home she visited the village school several times and drank water from well No. 1. She became sick about August 16th. The well at her home was shoal, but was not very badly located. Five children from this house attended the village school but none other in the family had typhoid fever.

Case N. A young lady of about eighteen; was attacked with typhoid fever September 3d. She had been teaching away from home, but came home two weeks before she was taken sick, and helped at the house of Case D, while Mrs. D. was sick. She thought she might have drank water from well No. 1.

Case O. Was that of a man thirty years of age, a blacksmith who boarded at the place supplied with water from well No. 6. He was attacked August 20th, after he had been boarding at this place two or three months. He also had water from other wells.

Case P. A young man of eighteen, boarded at the same place all summer and had water from well No. 6. Attacked with fever September 7th.

Case Q. A man of twenty-five years of age. Boarding at the same house with the two preceding cases. He was attacked September 17th. The customary water supply was from well No. 6.

Case R. A man about twenty-five years old. He boarded at the same place where well No. 6 was located three weeks before his illness. He came down with fever September 24.

Case S. A boy of seventeen was attacked August 15. He had been home in the village all summer, but had not visited houses in which there were cases of fever. He had apparently sampled water from all the wells in the village,—had drank water from well No. 1, No. 2, No. 6 and others. There had been no previous cases of typhoid fever in his house.

Case T. A girl of seven years. She was attacked September 14. She had been at home all summer and had drank water from all the wells, including No. 1, No. 2 and No. 6.

Case U. Of a man forty-six years of age. He was attacked August 7 and boarded at a house where, the year before, there had

been a case of typhoid fever. His customary supply of drinking water was from a well which was probably not affected as its location was much more favorable than that of most of the wells in the village.

Case V. A girl of sixteen years of age. Was attacked September 24. Her water supply at home was the same as that of Case U, but it is supposed that she drank water from well No. 1.

Case W. Was that of a boy aged sixteen. He was attacked September 24. He boarded at the place where well No. 2 is located and had used water from this well and well No. 6.

Case X. Was that of a young man who boarded at the house where well No. 1 was located. He was attacked in August.

Case Y. Was of a young woman whose home was out of the village, but she stayed in the village five weeks before her illness, boarding at a house supplied with water from well No. 1. She was attacked August 28th, eleven days after her return home.

Case Z. Was that of a young man who also lived outside of the village. He was attacked September 15th and thinks his illness was due to drinking water from well No. 2 while in the village. There were never cases of typhoid fever at his home before.

Case AA. A little girl four years old was attacked September 18th. The home water supply was from a spring at a considerable distance from apparent sources of pollution. She probably contracted the fever at the school.

Thus it will be seen that the foregoing descriptions of some of the wells in the village, together with the notes on the cases of typhoid fever, present pretty strong evidence that the outbreak was due to polluted well water.

It is very evident that one particular well, No. 1, had more to do than any other in causing the cases of fever. The construction and the surroundings of this well fitted it excellently for receiving the drainage from the surroundings. The ground, soaked with the privy accumulations, was well within the area of drainage of the well. Its distance of twenty feet from the well was much too slight to give any assurance of safety with any kind of ground; but, in this place, with a shallow soil and a ledge beneath it filled with fissures, which, we may assume, were ready to carry pollution directly into the well with but little previous soil filtration, the slight distance was doubly hazardous.

It will be noticed, too, that a case of typhoid fever occurred on these same premises the fall before, and that the typhoidal discharges were emptied into the privy during the first week of the man's illness.

The time at which most of the cases referable directly to this well occurred would lead us to suppose that the infective matter did not reach the well until near the time of the closure of the school, August 5. On the following day a school picnic was held on the school grounds, at which the pupils and some other persons attended.

Of the twenty-seven cases it would appear that seventeen had used the water from well No. 1. Of some of the other cases it was found impossible to exclude the possibility that they might have sometime during the four weeks before their attack drank water from the same well.

Of these seventeen cases referable to well No. 1, one occurred before the close of the school (August 1); one within a week after the school picnic; six within the second week; one within the third week; three within the fourth week; and two cases later than this.

One of these latest cases was not connected with the school nor was she at the picnic; as regards the other one, she, at home, used water from another well, near which there had been a case of typhoid fever the year before.

Cases O, P, Q, and R, appear to have been referable to well No. 6, where, on the same premises, there had been two cases of typhoid fever the year before.

H, apparently a secondary case, occurred in the same house with Case G, and attacked nearly four weeks later.

J. was the father of I. and became sick about five weeks after the disease was introduced into his home, and quite probably through the pollution of his well, No. 3.

The first case to occur was that of K. who came into the village in July sick with fever in a mild form, but no connection could be traced between this case and subsequent cases unless the child L. was infected indirectly through an infected lounge.

Chemical examinations of the water from the six wells herein described were made, but the samples were collected three months after the beginning of the outbreak and after the fall rains had occurred. The results of the examination then gave no indications

of pollution; nevertheless, this should not be taken as indicating an absence of infection at an earlier season, in some of the wells at least. Most of the wells in the village are badly located as regards liability to pollution, and without great care it is to be apprehended that other outbreaks of typhoid fever may arise in the future.

Typhoid Fever at Green's Landing.—The need of having every case of typhoid fever reported to the local board of health and through the local board to the State Board, is illustrated by an outbreak of typhoid fever in the village of Green's Landing, Deer Isle. A few cases were reported to the State Board in October, 1892, and no more until the arrival of a petition from the citizens of the village in December asking the State Board to investigate the matter. It is not known whether the cases were all reported to the secretary of the local board who lives some miles distant; the law should make typhoid fever, as well as scarlet fever and diphtheria, notifiable to the State Board.

In the absence of the secretary, when the petition came, Dr. F. C. Hitchcock of Rockland was asked to investigate the matter.

Report of Dr. Hitchcock.—In conformity with your request of the 13th inst., I have to report that I made a trip to Green's Landing on Thursday, the 15th, returning yesterday (Friday) P. M. Upon arrival I notified the chairman of the local board of health and the petitioners, who having assembled, the situation was quite fully discussed.

I soon found that the typhoid had been confined to one section of the town, the Thurlow district, and that the so-called "Thurlow well" seemed to have given origin to all the cases. This well is situated on nearly the highest ground of the section, and epidemics seem to have originated from this same locality for four or five years past. The formation of land seems to offer an opportunity of easy disposal of sewage to almost every inhabitant below this point, from the fact that it is a granite substratum thinly covered with soil, and the difficulty of sinking drains in this has led the residents to adopt a system of sink spout drainage peculiar to themselves,—it being that of throwing the sewage broadcast on the surface.

An imperfectly executed scheme for a drainage system was attempted some time since, when a drain was constructed upon the main street, beginning at F. E. Dwinell's house, and, seemingly from a lack of definite information on the part of the board of health as to their power of enforcing its extension to tide waters, which could easily have been done, ending upon the surface of the

rock at crest of hill below the Ocean View House; and allowing contents to be discharged ten feet above, and within twenty feet of, the public pump, this drain taking in the sewage of William Thurlow, in particular, at whose house occurred a fatal case of typhoid. For which reasons we ordered the present use of the pump discontinued, though it seems much needed in that locality.

The Thurlow well, with a former unsanitary history of four yearly epidemics, had the added misfortune of having had the soil in its immediate vicinity saturated with the undisinfected discharges of five fever patients of Nos. 1 and 2, before it was discontinued. Its never failing supply of water, unfortunately, in time of the drouth last year, when other wells entirely failed, made it an element of much more danger. In this connection, I might add that most of the other wells in this locality are quite shallow, are blasted out of the solid rock, and are generally sunk in the cellars of the respective houses.

The vaults used in connection with these houses, consisting of depressions in the rocks, surmounted by the usual sentry-box structures, are generally placed from ten to fifteen feet above. Still above these, on the crown of the hill, there had been allowed a series of camps occupied, during summer, by workmen; the drainage from which was over the surface of the rocks, their vaults the primitive ones of barbarism, and whose water supply was from any available source, there being no wells. Hence, in case No. 26, situated immediately below these camps, and, presumably, receiving their drainage into the well in the cellar, I ordered the well filled up with rock. No. 1, the Thurlow well, having already been condemned by the local board of health, we also ordered filled with stones.

In case of No. 33, a well which was carefully made and cemented at the top, by reason of its proximity (ten feet) to the termination of the sewer or drain heretofore described, we ordered its use suspended until a sample of its water should have been analyzed and a report received.

The prevalence of typhoid fever during later years has led to a quite general use of cisterns and rain water in houses recently erected, as, also, the boiling of well waters before use, and I strongly urged the extension of both these practices into all houses, old and new, without exception.

It appears that, some time ago, a charter was granted by the State Legislature for the purpose of bringing a supply of water into town from a lake situated about one and one-half miles inland, which waters had been pronounced by the State Assayer of good quality, but which charter had expired by limitation. We examined this lake, the contour of land, condition of soil and freedom from granite impediments; these all seemed to render the plan a feasible and practicable one, and we strongly urged the renewal of the charter, to the end that such a system might be adopted as speedily

as possible. We also advised that the discharges from fever patients should be rendered inocuous by some certain methods.

We suggest to the State Board of Health that they should instruct the local board of the town as to their powers relating to drains and drainage.

The following are the details of the house to house inspection:

No. 1. Three cases of fever. Found sink spout drainage at surface of ground; vault unsanitary, situated on bare rock twenty feet above house, above all cases of typhoid fever. Vault has been cleaned out by order of board of health. Water supply, Thurlow well, situated about 200 feet distant in swampy land. In this house occurred first case of typhoid. The discharges from this patient and others in the house, also in No. 2, were buried and thrown on surface of soil in immediate vicinity of well,—not disinfected. This well was ordered discontinued, but not filled, by order of the board of health.

No. 2.—Two cases, occurring two and five weeks after No. 1; water from Thurlow well; sink spout drainage, surface of ground; vault unsanitary, situated above house on granite rock; drainage extends to swamp containing Thurlow well. This came under the attention of the board of health.

No. 3.—One case; used water from Thurlow well until case occurred, then spring water; no vault; no sink spout drainage.

No. 4.—No sickness; water from Robbins' spring, boiled before use; no sink spout drainage; no vault.

No. 5.—No sickness; water from Robbins' spring; this spring has been bailed out and cleansed every week; no sink spout drainage; no vault or privy.

No. 6.—No sickness; sink spout conducted to surface by pipe; vault properly cleansed; water from Frank Tibbetts' well. This house is near top of direct street to village, and over the brow of hill from Thurlow district, having no direct connection with the latter, on the opposite water shed.

No. 7.—No sickness; used Tibbetts' well, now rain water; sink spout drainage to cesspool; vault in good condition.

No. 8.—No sickness; used Tibbetts' well, then cistern; sink spout to street drain.

No. 9.—One fatal case; had taken water from Thurlow well while visiting. Water supply of this house is from a well in the cellar; vault properly cared for; sink spout to street drain, probably the source of contamination of public well.

No. 10.—No sickness; water from Tibbetts' well; sink spout drainage purposely thrown on ground, away from vicinity of well, to avoid its pollution, drainage being impossible; vault properly cared for.

No. 11.—No sickness; cistern water; sink spout to road beneath; vault properly cared for.

No. 12.—No sickness; cistern and rain water; sink spout on surface; vault perfect.

No. 13.—No sickness; new well on shore; sink drainage emptied into sea; vault perfect.

No. 14.—No sickness; conditions same as 13.

No. 15.—No sickness; conditions same as 13.

No. 16.—No sickness; Coomb's well; conditions same as 13.

No. 17.—No sickness; cistern water; sink drainage to sea wall; vault properly cared for.

No. 18.—No sickness; cistern water; sink spout to sea wall; vault correct.

No. 19.—No sickness; cistern water; sink spout to near tide waters.

No. 20.—No sickness; cistern, well, Sea View House; drain to shore. This and No. 19 should be connected to tide water.

No. 21.—No sickness; well in cellar; sink spout to surface; vault on rock above.

No. 22.—No sickness; well in cellar; sink spout to surface; vault properly cared for.

No. 23.—No sickness; cistern; sink spout good; no vault.

No. 24.—No sickness; cistern; sink spout to street; vault sanitary.

No. 25.—Various camps. No sickness; vaults, surface of ground; no water; sink spout, surface; typhoid in 1891; advised local board of health to suppress.

No. 26.—One case now existing; well in cellar, not stoned; no sink spout; vault unsanitary. Family suspect sickness arose from camp above, though the patient had used water from public well and had communication with No. 9. Well ordered closed, and vault cleansed.

No. 27.—No sickness; one of the camps directly above No. 26; cistern; drainage to surface of rock; no vault; case typhoid in 1891.

No. 28.—No sickness; vaults all right; surface drainage; water various, rain and well.

No. 29.—Sick with typhoid; water, public well; sink drainage on surface; vault, sanitary.

No. 30.—One case typhoid; water, public well, rain water, and well in cellar; sink spout to surface.

No. 31.—One case; water, public well; house situated in a hollow immediately below four drains on hill; no sink spout; slops thrown in sea; vault properly cared for; complaint made of outlet of drains, ordered connected to sea.

No. 32—One case existing; public well; rain water filtered; has used Thurlow well; drainage led from house; vault imperfect.

No. 33—Ocean View house; no sickness; sink spout drainage to sea; vault cleaned every three months; water supply, well carefully built and well cemented, but situated within fifteen feet of street drain or sewer; this well ordered discontinued until analysis is made.

Nine cases of fever were apparently referable to the Thurlow well and four to the public well.

Very respectfully yours,
F. C. Hitchcock, M. D.

The analysis of the sample of water from the public well (No. 799 in the tabulation) gave unfavorable results, and the following is from the report to the secretary of the local board:

Please communicate the results of the examination to the member of the local board of health at Green's Landing, if there is a member there, or to the people of that place. The analysis gives results that are indicative of pollution, and from a personal examination made of some of the wells in the village some years ago, I should fear that many other wells in the village are also polluted. With this I enclose a typewritten copy of the report of Dr. Hitchcock on the sanitary conditions at Green's Landing, for I feel sure it will be of considerable value to you.

Typhoid Fever in Kittery.—In 1892 there were only nine cases of typhoid fever in the town of Kittery, but four of these ended fatally. A newspaper clipping and a letter from a citizen gave the Board the first intimation of an outbreak of typhoid fever in the village. The place was immediately visited by the secretary. Each one of the members of the local board of health was seen and after a rapid survey of the situation was made, the local board was urged to meet immediately and arrange, with the co-operation of the municipal officers, to take immediate measures for the suppression of the outbreak and to make certain sanitary improvements. The following letter was sent to the board of selectmen of Kittery:

Dear Sirs:—On account of the reported prevalence of typhoid fever in your village I visited your town last Saturday and saw and conferred with each of the members of your local board of health.

I advised a conference with your board of selectmen as to whether the local board of health should be authorized to employ an inspector for a limited time this year, and preferably for succeeding years, for the purpose of making a sanitary house to house examination of the village. The inspector may consist of any intelligent person whom the local board can instruct as to what they want done and how to do it. With the help of the inspector I suggested that the Board seek to trace the present prevalence of typhoid fever to its cause or causes, place in every household the circulars of the State Board of Health that would be helpful in the presence of an emergency (Circular No. 46, on typhoid fever particularly); make a house to house inspection of the existing conditions and suggest changes that are called for.

Another important thing that should be done is the disinfection of places where there have been cases of typhoid fever, especially

of the privy vaults. A local board of health properly organized has ample authority to do what is needed and what is necessary in an emergency like that now existing in your village. The sentiment of your citizens, I should judge, calls for work.

Yours truly,

A. G. Young, *Secretary.*

October 26th a letter was received from the secretary of the local board of health stating that the recommendation as to the appointment of an inspector has been endorsed and referred to the selectmen and that no new cases of typhoid fever had occurred. In reply the following letter was sent:

Dr. L. O. Buzzell,

Secretary Local Board of Health, Kittery.

Dear Sir:—Please accept my thanks for yours of the 27th. I am glad that you have no new cases of typhoid fever. I received a letter Saturday from F. H. Bond, chairman of the selectmen, who writes that: "The selectmen will be in accord with our Board of Health in all matters relating to the improvement of the sanitary condition of our people. The Board has a power, under the law, which is almost absolute. Any agent or agents which the Board may employ will meet with our approval and the cost required to carry out the measures you suggest, will be cheerfully paid."

I would strongly urge your Board to bring about an improvement of the sanitary condition of the village with a view to the future as well as the present welfare of the people. It is indicated strongly on account of the danger of cholera another year, as well as the ever present danger of typhoid fever and other diseases. Circulars No. 23 and No. 66 are suggestive of some methods that the people ought to be willing to be taught.

Yours truly,

A. G. Young, *Secretary*

Exhibit at the Columbian Exposition.—The Board received assurance from the Maine World's Fair Commission that a small amount was placed at its disposal to aid in making an exhibit at Chicago. The amount was less than was needed and came too late (January, 1893) to enable the Board to do as much work as was desired. Under the circumstances it was resolved to cover and illustrate only a small corner of our field of work,—the most important points in the sanitary construction of school buildings. A series of charts were therefore prepared, showing the most essential points in the sanitary construction of school buildings, a subject which has been pretty thoroughly worked out by the Board. The exhibit was forwarded to Chicago in April, but in

August the Board was surprised to learn that it was not yet installed. It was, however, put in place in September and even at that late date attracted favorable notice, and a diploma was awarded for the work, so we have been notified.

DRINKING WATER AND WATER ANALYSIS.

On account of the pressure of other work in the office, it has been impossible to do promptly all the work that has been called for in this line, nevertheless, 227 samples of water were examined during the two years. Of these, 132 were from wells; 60 from springs; 22 from rivers and other streams; 9 from ponds; 2 from samples of ice; 1 from a cistern; and 1 the source of which was not stated. Again, 22 of these samples were from public water supplies, and 9 from proposed public water supplies.

It seems desirable to correct a popular impression, so far as it prevails, that the information which is derived from the chemical examination of a sample of water is all that is required in pronouncing positively whether the water is safe or unsafe as a drinking supply. The chemical analysis is but one of the aids in judging whether a water is suitable or unsuitable for drinking, and, indeed, in some cases, it is not the most trustworthy guide in the solution of the question. For instance, a sample comes from a well. The analysis shows that it is a water neither very bad nor very good chemically. The chemical processes indicate a definite quantity of those contents which guide us in estimating the character of a water; yet, of this water, it is impossible to say from the chemical point of view alone whether it is safe or unsafe for drinking.

But, from the description of the source and its surroundings, it is learned that the well is twenty feet deep, that there is a common leaching privy vault twenty feet from the well, and that the sink drainage discharges upon the ground thirty feet from it. These facts relating to the history of the well are worth more in this case than the analysis. From the analysis we can say no more than that the water is suspicious; from the facts learned by an inspection of the well and its surroundings, the duty would be

imposed of cautioning the users of the water against a serious danger, no matter what the analysis says.

In this case the grounds which we have for warning of danger are these: The common observation of physicians has taught them that the prevalence of typhoid fever is much greater among the users of water from wells situated as this one is, than it is among those who have a water supply not exposed to the danger of pollution.

Again, it has been learned from experience by engineers and agriculturists who have had much of that kind of work to do, that, in land drainage, a drain one foot deep will drain a strip of land five feet on either side of it, and an additional five feet for every foot of increase in the depth of the drain. Hence the most of them formulate the rule: for ordinary soils, drains four feet deep and forty feet apart; for each is expected to drain a strip of land twenty feet on either side of it, or forty feet wide.

Now, a well, receiving its water from the ground as it does, acts in the capacity of a drain, and the rule which has just been mentioned may be applied to it. If it is twenty feet deep, or rather, if it is twenty feet down to the surface of the water in it, we may expect its drainage influence at the surface of the ground to extend around it one hundred feet in all directions. The probable sources of pollution, therefore, which surround the hypothetical well which serves our purpose, are far within the area of drainage of the well.

There are, however, several reasons why a fixed rule for the distance of wells from possible sources of pollution cannot be laid down. One, working on the side of safety, is that soils are capable in varying degrees, of acting as filters, not only in arresting and holding back the deleterious matter, but, through their nitrifying power, of converting dangerous organic matter into harmless inorganic salts. As results of this analysis we have a very moderate quantity of organic matter as indicated by the ammonias, but there is a quantity of chlorides somewhat in excess of that normally found in the water from unpolluted soils, and there is a large excess of nitrates.

On the side of danger is the fact that soils, saturated and overpowered with filth, lose their capacity of serving as efficient filters, and, sooner or later, cease to protect from pollution wells sunk through them.

Still further increasing the danger from sources of filth in the neighborhood of wells is the incapability of certain strata to act as efficient filters. Coarse gravel manifestly serves but poorly as a filter, but a soil composed of sand or ordinary loam, and of great depth before impermeable strata are reached, is much more trustworthy as a natural filter. But the condition which favors the pollution of wells more than any other, is that in which a comparatively shallow layer of pervious soil overlies an impermeable stratum of rock or clay down to which the well has been sunk.

In the neighborhood of such wells, filthy surface drainage passing downward, is not purified before it reaches the impermeable rock or clay along whose surface it flows, working out channels to the well more and more direct as time passes on. The analyses in this office show very frequently gross pollution of the waters from wells thus situated.

As has been stated before in these reports, waters may be divided into three classes: those which are chemically pure; those which are positively bad; those which are neither very good nor very bad.

In this last class of waters, particularly, the history of the source and its surroundings is indispensable in judging whether they are safe as drinking waters, or whether they are polluted or liable to pollution. In all cases, therefore, a blank must be returned, giving answers to the following questions among others: The source of the sample? Its situation and surroundings with reference to possible sources of pollution? If a well, was it dug, bored, driven, or drilled? Depth? Depth of water at time of taking sample? Age of well? Distance from privy? Stable? Barnyard? Sink drainage, etc.? Any other source of filth? Nature of soil and character and thickness of successive strata? "Lay" of the land, as regards drainage toward or from the well or spring? How many years has the ground been occupied by buildings? Is lead pipe used? Sickness, present or past, among the users of the water?

These questions should all be considered by the owners of wells and springs, and by local boards while making inspections. Their answers must be at hand to go with the numerical statements of chemical results when an opinion is rendered as to a given sample.

Some waters, whether from wells, springs, streams or ponds, vary considerably in their characters at different times. When, therefore, a single sample comes from a proposed public water

supply, there should be a hesitation in basing an approval or a condemnation upon the results of a single analysis, and, in the absence of a full knowledge of the proposed source, its water shed, etc., an opinion should not be given. A chemical analysis is of value, but a careful and intelligent inspection of the ground to determine whether present or probable future sources of pollution with animal, and, particularly, with human, excreta exist, is more important.

The answer often sought when samples are sent is this: "Is the water infected?" Or, "Does it contain the germs of typhoid fever?" This, a chemical analysis cannot answer directly. A chemical analysis shows that a well water is polluted. Sources of infection are, usually, vaults or other places of disposal of excreta. A well which is accessible to polluting matter from such places is likely to receive infection from the same sources, if these places happen to receive infectious material. Thus, if the water is found to be polluted, danger is indicated; but the dangerous agent, the infectious germ is not demonstrated.

On the other hand, waters which are not polluted rarely convey infection, nevertheless, it is quite possible for a water, chemically not bad, to be infectious.

In 1885 a sudden and very serious outbreak of typhoid fever occurred in Plymouth, Pa., in which more than 1,100 cases occurred within a short time. The cause was traced to the dejections of a single typhoid fever patient, which were washed into the stream above the four dams which had been built for the purpose of imponding the water for the supply of the town. The water was, unquestionably, infected, nevertheless, chemical analysis gave fairly good results.

In the determination of some of the contents of waters which serve as indexes of their degrees of purity or of pollution, one part in millions may easily be determined, yet the quantity of organic matter in a number of bacteria sufficient to make a water infectious, is so inconceivably small as to give no reaction with chemical re-agents.

If then, chemical processes do not enable us to say positively whether a water is, or is not, infected, what may we hope from bacteriological methods? Bacteriology has failed to detect the specific contagion of diphthera or scarlet fever in drinking water;

its chief value in the examinations of potable waters has been in the determination of the presence or absence of the bacillus of typhoid fever, or of the cholera spirillum.

But in the great majority of instances in which the search has been made for the typhoid bacillus, in waters in which there was good reason to believe it present, the result has been negative or doubtful, even when the search has been made by the most experienced of investigators.

There is, therefore, no method available which will determine positively that a given sample of water is *not* infected.

Chemical analysis is valuable for indicating the danger of the presence of infection. A microscopical examination is useful for sometimes showing the presence of animal and vegetable organisms whose favorite habitat is impure water, and in detecting particles of dead organic matter of kinds usually derivable from filthy drainage. The bacteriologic analysis sometimes indicates positively the presence of infection, but oftener leaves doubt whether it has not, after all, been present.

This explanation emphasizes the importance of an ocular inspection of sources of water supply, and an intelligent judgment based upon the "findings" as to whether a given place is suitable for seeking a new water supply, or whether a well or spring is so located as to be free from the danger of filthy soakage. A well or spring which is manifestly exposed to such dangers cannot have a clean bill of health, no matter what chemistry and bacteriology say.

Water Analyses.

ANALYSES OF SAMPLES OF WATER—Expressed in Parts per 100,000.

Number of analysis.	Origin of Sample.	Date of collection.	Total solids.	Loss on ignition.	Hardness.	Chlorine.	Free ammonia.	Organic ammonia.	Nitrites.	Nitrates.
		1892.								
700	Well, Wilton	January 1,	9.2	2.4	1.95	.6	.000	.001	None	Heavy trace.
701	Spring, East Monmouth	January 8,	12.0	2.2	6.71	.4	.001	.000	Slight trace	Trace.
702	Well, Castine	January 9,	13.4	8.2	4.29	1.2	.001	.005	None	Much.
703	—— Castine	January 11,	18.8	4.6	7.43	2.8	.001	.009	Very slight trace.	Much.
704	Well, Chesterville	January 11,	8.8	2 2	4.57	.5	.001	.003	Very slight trace.	Much.
705	Well, Deering	January 16,	28.0	18.0	11.80	3.6	.000	.001	Very slight trace.	Much.
706	Well, East Baldwin	February 8,	6.4	2.2	3.90	1.8	.013	.014	Trace	Trace.
707	Well, Bangor	February 12,	29.6	10.2	12.56	4.0	.001	.015	None	Much.
708	Spring, Bangor	February 12,	38.2	15.6	13.31	4.2	.003	.013	None	Much.
709	Well, Bangor	February 12,	36.2	15.8	18.02	5.2	.000	.005	None	Much.
710	Spring, Bangor	February 11,	12.2	2.8	10.30	.4	.000	.002	None	Trace.
711	Little River, Gorham	February 19,	5.2	2.4	2.60	.4	.003	.014	None	Trace.
712	Well, Augusta	March 3,	21.0	13.4	8.86	.6	.000	.010	Very slight trace.	Much.
713	Well, Old Orchard	March 12,	42.2	5.0	4.57	2.8	.006	.018	None	Heavy trace.
714	Well, Limington	March 16,	25.6	2.8	4.57	7.8	.000	.012	None	Heavy trace.
715	Well, Limington	March 16,	5.6	4.4	2.60	.5	.000	.003	None	Heavy trace.
716	Well, Gardiner	March 23,	92.6	14.4	40.80	6.4	.000	.006	Very slight trace.	Heavy trace.
717	Well, Bangor	March 25,	42.0	11.6	28.42	1.2	.001	.011	None	Heavy trace.
718	Well, Mt. Vernon	April 1,	33.6	8.0	8.86	12.2	.003	.005	None	Much.
719	Spring, Cornish	April 7,	8.2	3.4	4.57	.6	.004	.002	None	Much.
720	Spring, Oakland	April 26,	21.0	9.4	9.57	2.4	.001	.005	Very slight trace.	Very much.
721	Water supply, Lewiston	April 30,	7.0	2.8	2.99	.6	.007	.030	None	Slight trace.
722	Water supply, Lewiston	April 30,	3.6	2.8	1.69	.2	.000	.020	None	Very slight trace.
723	Water supply, Lewiston	May 7,	3.2	2.4	1.27	.4	.003	.018	None	Very slight trace.
724	Water supply, Lewiston	May 7,	3.4	2.8	1.69	.4	.006	.016	None	Very slight trace.
725	Sprnig, Augusta	May 9,	4.6	3.8	2.60	.4	.001	.007	None	Heavy trace.

726	Well, Portland	May	2,	12.6	4.8	3.90	2.0	.005	.014	None	Much.
727	Well, Bangor	May	10,	34.4	16.8	18.02	3.4	.001	.014	Very slight trace.	Heavy trace.
728	Well, Gorham	May	13,	10.6	5.4	5.29	2.8	.028	.007	Trace	Much.
729	Well, Bradford	May	25,	10.0	4.6	6.43	.8	.000	.002	Trace	Much.
730	Well, Portland	May	31,	5.0	2.8	1.27	2.0	.000	.063	None	Trace.
731	Water supply, Brunswick	June	10,	4.6	2.2	1.27	.4	.008	.017	None	Very slight trace.
732	Water supply, Brunswick	June	10,	3.4	2.4	1.95	.2	.002	.011	None	Very slight trace.
733	Well, Houlton	June	13,	40.8	30.8	31.26	3.2	.000	.002	Trace	Much.
734	Well, East Machias	June	19,	11.0	3.6	1.95	.8	.000	.006	Trace	Much.
735	Well, Augusta	July	5,	5.0	2.6	2.34	.4	.011	.006	Very slight trace.	Trace.
736	Well, Madison	July	8,	10.0	7.8	2.99	.4	.000	.002	Very slight trace.	Heavy trace.
737	Spring, Bangor	July	13,	37.2	22.2	12.56	3.8	.000	.006	Heavy trace	Very much.
738	Spring, Bangor	July	13,	8.6	3.8	5.29	.6	.000	.001	Very slight trace.	Much.
739	Spring, North Yarmouth	July	12,	5.8	3.0	2.34	.6	.000	.005	Trace	Very slight trace.
740	Well, North Yarmouth	July	13,	66.2	41.4	21.10	9.0	.005	.016	Very slight trace.	Much.
741	Well, Grand Beach	July	15,	13.0	7.6	3.90	2.0	.001	.013	Very slight trace.	Much.
742	Well, Grand Beach	July	15,	20.6	11.2	5.00	3.6	.002	.013	None	Much.
743	Well, South Berwick	July	22,	6.2	5.2	1.95	.4	.001	.004	Very slight trace.	Trace.
744	Well, South Berwick	July	22,	20.8	12.4	5.29	2.4	.006	.005	Very slight trace.	Much.
745	Spring, Dixfield	July	27,	7.6	3.0	5.7	.4	.000	.004	Very slight trace.	Trace.
746	Well, Bangor	August	5,	52.8	26.8	22.02	3.6	.003	.011	Very slight trace.	Very much.
747	Well, Saco	August	9,	13.2	4.6	6.71	.3	.001	.008	Very slight trace.	Very slight trace.
748	Well, Saco	August	9,	19.2	6.6	9.11	1.0	.012	.006	Very much	Very slight trace.
749	Well, North Augusta	August	16,	56.0	29.8	9.57	6.6	.045	.115	Very much	Much.
750	Well, North Berwick	August	17,	13.2	6.2	6.43	1.0	.000	.002	Very slight trace.	Very slight trace.
751	Well, Brunswick	August	18,	28.4	16.8	6.00	2.6	.001	.011	Very slight trace.	Heavy trace.
752	Well, Hallowell	August	20,	40.4	14.6	18.49	2.8	.007	.013	Very slight trace.	Much.
753	Well, Kennebunk	August	18,	26.0	6.0	12.56	3.8	.005	.009	Very slight trace.	Very slight trace.
754	Well, Sabattus	August	18,	60.6	22.2	29.04	8.2	.001	.010	Very slight trace.	Much.
755	Spring, Augusta	August	21,	6.8	3.2	2.86	.6	.001	.003	Very slight trace	Much.
756	Well, Hurricane Isle	August	30,	13.6	9.4	3.25	2.6	.003	.006	Trace	Much.
757	Spring, Bangor	August	21,	23.0	11.8	8.86	2.6	.015	.009	Very slight trace.	Much.
758	Spring, Sangerville	September	5,	20.2	7.0	18.81	.4	.000	.004	None	Heavy trace.
759	Spring, Sangerville	September	5,	19.2	4.6	19.60	.4	.001	.001	None	Heavy trace.
760	Spring, Sangerville	September	5,	14.0	5.2	12.56	.3	.000	.001	None	Heavy trace.
761	Spring, Castine	September	5,	19.4	6.4	13.31	1.2	.004	.007	None	Very slight trace.
762	Spring, Bangor	September	11,	51.4	26.0	22.86	4.4	.000	.003	Very slight trace.	Heavy trace.
763	Well, Pittsfield	September	27,	22.4	11.4	12.56	3.2	.004	.007	Very slight trace.	Heavy trace.
764	Well, Pittsfield	September	28,	41.2	7.5	21.19	6.0	.000	.001	None	Trace.
765	Well, Dexter	September	25,	16.2	7.0	11.05	1.2	.000	.000	Very slight trace.	Heavy trace.
766	Spring, Kennebunk	September	29,	5.4	1.8	2.60	.5	.002	.002	None	Trace.
767	Well, Pittsfield	September	28,	26.2	12.4	10.00	2.6	.001	.002	None	Much.
768	Water supply, Waterville	October	6,	3.8	2.4	1.95	.2	.000	.011	None	Very slight trace.
769	Spring, Limington	October	7,	6.0	4.4	3.64	1.0	.000	.003	None	Heavy trace.
770	Well, Livermore Falls	October	4,	36.2	6.8	12.56	3.8	.000	.009	Trace	Much.
771	Well, Brooks	October	7,	6.0	3.6	4.57	.6	.000	.007	None	Slight trace.
772	Well, Gardiner	October	3,	25.0	6.4	16.43	4.2	.105	.004	Much	Very much.

ANALYSES OF SAMPLES OF WATER—Expressed in Parts per 100,000—CONTINUED.

Number of analysis.	Origin of Sample.	Date of collection.	Total solids.	Loss on ignition.	Hardness.	Chlorine.	Free ammonia.	Organic ammonia.	Nitrites.	Nitrates.
773	Spring, Foxcroft	September 27,	16.4	2.8	14.84	.2	.000	.002	Slight trace	Heavy trace.
774	Well, Pemaquid	October 10,	4.6	1.8	1.69	.7	.000	.015	None	Slight trace.
775	Spring, Maplewood	October 14,	4.2	2.2	3.90	.0	.008	.015	None	Very slight trace.
776	Well, Augusta	October 29,	3.4	1.4	3.90	.1	.000	.007	Very slight trace.	Very much.
777	Well, Yarmouthville	October 27,	17.4	14.2	13.31	5.4	.001	.004	None	Very slight trace.
778	Well, Yarmouth	October 27,	34.4	11.2	12.56	5.4	.001	.005	None	Much.
779	Well, Yarmouth	October 27,	6.2	2.2	4.57	1.0	.001	.002	None	None.
780	Spring, Yarmouth	October 28,	8.2	3.6	5.29	1.0	.004	.006	Slight trace	Much.
781	Spring, Penobscot	October 29,	6.0	2 6	5.29	.8	.000	.004	Very slight trace.	Much.
782	Well, Alfred	October 29,	2.6	1.4	3.25	.6	.900	.004	None	Very slight trace.
783	Cistern, Alfred	October 30,	4.6	2.6	4.86	.2	.001	.008	None	Slight trace.
784	Spring, Brunswick	November 1,	20.6	7.4	7.43	4.4	.001	.002	Slight trace	Very much
785	Spring, Brunswick	November 1,	23.0	7.4	13.01	4.4	.007	.002	Heavy trace	Very much.
786	Water supply, Waterville	November 16,	4.4	2.4	3.25	.2	.000	.013	None	Slight trace.
787	Well, Augusta	November 12,	21.4	4.2	14.84	1.2	.002	.008	None	None.
788	Well, Augusta	November 9,	5.4	2.4	3.90	.5	.008	.002	Trace	Heavy trace.
789	Well, Gardiner	November 11,	24.8	10.4	14.84	4.8	.003	.007	Trace	Much.
790	Well, Ashland	November 14,	26.2	4.0	20.60	.8	.000	.000	Trace	Trace.
791	Well, Ashland	November 14,	24.4	5.4	18.02	.4	.000	.007	Trace	Heavy trace.
792	Well, Ashland	October 24,	27.2	6.8	20.40	1.4	.000	.000	Slight trace	Heavy trace.
793	Well, Ashland	October 24,	24.4	5.4	17.22	.6	.000	.002	None	Heavy trace.
794	Well, Ashland	October 24,	20.6	2.8	16.43	.6	.000	.000	Slight trace	Much.
795	Well, Ashland	October 24,	26.6	6.8	18.49	.6	.000	.002	Slight trace	Heavy trace.
796	Water supply, Biddeford	November 25,	5.8	3.4	.79	.2	.003	.013	None	None.
797	Water supply, Biddeford	December 5,	3.4	2.8	.95	.2	.000	.012	None	None.
798	Well, Topsham	December 12,	9.8	2.6	4.16	1.4	.001	.005	Trace	Much.
799	Well, Green's Landing	December 19, 1893.	14.2	5.8	7.43	4.4	.000	.013	Trace	Heavy trace.
800	Water supply, Waterville	January 1,	3.0	2.2	1.95	.2	.001	.015	None	Very slight trace.
801	Ice, South Berwick	January 29,	.8	.2	.48	.0	.002	.007	Very slight trace.	Very slight trace.

802	Ice, South Berwick	January	27,	.8	.6	.00	.1	.031	.002	Very slight trace. Very slight trace.
803	Spring, Unity	February	8,	10.0	4.0	6.00	.4	.000	.003	Trace Heavy trace.
804	Spring, Union	February	8,	11.0	2.8	3.90	.6	.000	.002	None Slight trace.
805	Well, New Gloucester	February	7,	18.0	4.6	6.43	2.8	.004	.011	Trace Heavy trace.
806	Spring, Unity	February	27,	7.2	3.4	5.00	.1	.001	.002	Trace Heavy trace.
807	Spring, Unity	February	28,	7.4	2.6	5.57	.2	.010	.005	Heavy trace Heavy trace.
808	Spring, Norridgewock	March	9,	6.8	4.2	2.60	.8	.001	.003	Trace Much.
809	Spring, Norridgewock	March	9,	5.2	4.6	2.60	.6	.006	.018	Trace Much.
810	Well, Augusta	March	13,	20.0	7.8	9.29	2.2	.000	.009	Very slight trace. Much.
811	Well, Berwick	March	20,	45.4	25.2	14.81	7.0	.009	.008	Heavy trace Much.
812	Spring, South Brewer	March	22,	16.4	5.0	11.20	.4	.001	.002	Trace Trace.
813	Well, Livermore Falls	April	4,	4.4	4.0	3.90	.6	.001	.006	Trace Heavy trace.
814	Spring, Machiasport	April	11,	20.2	7.6	11.80	3.6	.003	.004	Very slight trace, Heavy trace.
815	Spring, North Vassalboro	April	1,	11.4	6.4	6.43	.8	.007	.009	Very slight trace. Heavy trace.
816	Well, North Vassalboro	April	13,	35.6	18.0	12.56	6.4	.004	.007	Very slight trace. Much.
817	Well, North Vassalboro	April	13,	97.4	47.4	36.01	12.2	.008	.017	Much Much.
818	Well, Gilead	April	20,	5.4	2.6	1.95	.6	.001	.003	Very slight trace. Much.
819	Well, Gilead	April	20,	4.2	1.8	1.56	.6	.050	.009	Slight trace Much.
820	Well, South Berwick	April	28,	11.4	3.6	6.43	1.0	.003	.005	None Heavy trace.
821	Well, South Berwick	April	28,	59.0	10.4	11.05	17.8	.017	.007	Much Much.
822	Well, Belfast	May	9,	32.0	14.2	12.56	4.2	.003	.014	Slight trace Much.
823	Well, Brunswick	May	10,	10.4	3.0	4.57	1.2	.000	.005	Very slight trace. Much.
824	Well, Gorham	May	9,	7.4	2.6	6.60	.6	.001	.005	Very slight trace. Slight trace.
825	Water supply, Bar Harbor	May	18,	2.4	2.0	.95	.6	.000	.014	None Very slight trace.
826	Water supply, Bar Harbor	May	18,	2.2	1.8	.95	.8	.000	.008	None Very slight trace.
827	Water supply, Bar Harbor	May	19,	2.4	2.2	.95	.8	.000	.013	None Slight trace.
828	Spring, Yarmouth	May	21,	23.2	7.2	7.43	4.2	.097	.015	Trace Very much.
829	Well, Portland	May	22,	37.2	15.4	13.91	5.4	.000	.007	Slight trace Very much.
830	Well, Norway	May	22,	6.0	2.8	.95	1.6	.000	.005	Very slight trace. Heavy trace.
831	Spring, Bangor	May	23,	8.0	2.6	5.29	.4	.000	.000	Very slight trace. Trace.
832	Well, Freeport	May	24,	35.4	20.0	11.50	5.2	.002	.019	Very slight trace. Very much.
833	Water supply, Bar Harbor	June	1,	2.4	2.2	.95	.6	.000	.008	None Very slight trace.
834	Water supply, Bar Harbor	June	1,	2.6	1.8	.95	.6	.001	.010	None Very slight trace.
835	Water supply, Bar Harbor	June	1,	2.6	1.6	.95	.7	.000	.006	None Very slight trace.
836	Well, Augusta	June	3,	6.0	3.0	3.90	.6	.007	.002	Very slight trace. Trace.
837	Well, Oakland	June	3,	17.8	6.0	11.50	.2	.000	.002	Very slight trace. Trace.
838	Spring, Oakland	June	3,	19.0	7.0	16.43	1.6	.000	.000	Very slight trace. Much.
839	Well, Bucksport	June	6,	5.2	2.4	2.99	.8	.000	.002	Very slight trace. Trace.
840	Water supply, Augusta	June	11,	3.4	3.2	1.95	.2	.007	.011	Very slight trace. Very slight trace.
841	Spring, Lisbon Falls	June	9,	6.0	2.4	2.99	.4	.030	.003	Slight trace Trace.
842	Well, Pine Point	June	9,	5.8	2.8	2.34	2.0	.000	.006	None Trace.
843	Well, Arnold	June	13,	13.4	6.0	8.14	.4	.000	.004	Very slight trace. Heavy trace.
844	Spring, Livermore Falls	June	13,	5.2	4.0	6.71	.1	.000	.002	Trace None.
845	Brook, Livermore Falls	June	13,	6.2	2.8	5.29	.1	.000	.015	None Very slight trace.
846	Spring, Livermore Falls	June	13,	3.8	3.0	1.95	.2	.000	.006	Very slight trace. Slight trace.
847	Well, Cornish	June	19,	4.2	3.2	3.64	.2	.000	.002	None Slight trace.
848	Water supply, Waterville	June	20,	3.6	2.6	1.69	.2	.001	.015	None Very slight trace.

ANALYSES OF SAMPLES OF WATER—Expressed in Parts per 100,000—Concluded.

No. of analysis.	Origin of Sample.	Date of collection.	Total solids.	Loss on ignition.	Hardness.	Chlorine.	Free ammonia.	Organic ammonia.	Nitrites.	Nitrates.
849	Well, Limington	June 21,	23.2	8.2	8.44	3.6	.057	.630	Much	Very much.
850	Well, Bethel	July 1,	2.4	1.6	1.95	.2	.001	.002	None	Very slight trace.
851	Well, Vinalhaven	July 4,	54.4	11.6	9.57	8.2	.005	.008	Slight trace	Very much.
852	Spring, Westbrook	July 6,	8.0	3.8	5.29	1.4	.000	.000	Trace	Heavy trace.
853	River, Westbrook	July 6,	2.6	1.8	1.27	.1	.000	.010	Very slight trace.	Trace.
854	Well, Peaks Island	July 12,	5.2	2.2	1.69	.1	.001	.000	Very slight trace.	Heavy trace.
855	Spring, Augusta	July 12,	11.6	4.0	6.71	.6	.003	.004	Heavy trace	Heavy trace.
856	Water supply, Augusta	July 15,	4.0	2.8	1.95	.1	.003	.006	Very slight trace.	None.
857	Well, Gorham	July 24,	6.4	2.6	1.27	1.0	.001	.002	None	Very slight trace.
858	Well, Lisbon Falls	July 24,	13.8	8.2	3.25	1.2	.002	.003	Slight trace	Very slight trace.
859	Well, Hiram	July 25,	20.2	12.8	3.90	3.0	.057	.011	Very much	Much.
860	Well, Augusta	July 25,	13.8	8.4	5.71	2.6	.009	.003	Very slight trace.	Trace.
861	Spring, Bangor	July 26,	17.2	5.8	9.57	.4	.000	.000	Very slight trace.	Slight trace.
862	Well, Lisbon Falls	July 31,	12.4	7.6	3.25	1.2	.328	.008	Very slight trace.	Heavy trace.
863	Spring, Portland	August 7,	9.6	4.2	4.29	.7	.000	.001	Very slight trace.	Very slight trace.
864	Well, Gorham	August 8,	27.0	10.0	14.84	3.6	.004	.016	Much	Trace.
865	Well, Augusta	August 8,	10.6	5.2	6.00	.4	.001	.007	None	Very slight trace.
866	Spring, Boothbay Harbor	August 10,	12.8	7.2	4.57	2.0	.008	.005	Slight trace	Trace.
867	Well, Wilton	August 24,	25.0	5.0	5.29	3.0	.000	.009	Slight trace	Heavy trace.
868	River, Mechanic Falls	September 10,	2.4	2.2	1.69	.2	.004	.013	None	None.
869	Brook, Mechanic Falls	September 10,	5.0	2.0	1.95	.2	.007	.013	None	None.
870	Pond, Mechanic Falls	September 10,	6.0	5.0	1.95	.2	.018	.024	None	None.
871	Pond, Mechanic Falls	September 10,	4.4	2.4	1.27	.2	.006	.018	None	None.
872	Well, South Berwick	September 12,	59.0	27.2	18.02	5.0	.008	.008	Very much.	Much.
873	Well, South Berwick	September 12,	14.0	3.2	5.57	2.2	.030	.005	Very slight trace.	Very slight trace.
874	Well, Dexter	September 12,	24.4	12.2	11.84	1.4	.000	.002	None	None.
875	Well, Portland	September 11,	20.6	4.4	5.29	1.2	.001	.000	Very slight trace.	None.
876	Well, North Sebago	September 14,	2.8	2.2	1.95	.3	.000	.002	None	None.
877	Well, Calais	September 13,	18.4	5.0	8.86	2.6	.003	.012	Slight trace	Slight trace.
878	Well, Bath	September 11,	18.2	4.2	4.29	3.0	.004	.007	Very slight trace.	Slight trace.
879	Well, Dexter	September 16,	14.0	5.0	9.29	1.2	.003	.006	Very slight trace.	Much.

880	Well, Bluehill	September 13,	51.0	28.4	22.86	7.0	.024	.015	Very much	Very much.
881	Spring, Mechanic Falls	September 20,	20.6	11.2	6.71	2.4	.007	.012	Trace	Very much.
882	Spring, Limington	September 20,	2.0	1.6	1.95	.2	.000	.001	None	Heavy trace.
883	Spring, Limington	September 20,	4.0	1.0	2.60	.2	.003	.002	Very slight trace.	Heavy trace.
884	Well, Bath	September 21,	58.0	14.0	21.68	15.6	.038	.054	Trace	Very much.
885	Well, Burnham	September 22,	8.6	3.6	3.51	.8	.000	.002	Very slight trace.	Very much.
886	Well, Bangor	September 24,	52.2	25.2	17.22	8.0	.001	.005	Much	Much.
887	Well, Fairfield	September 26,	11.0	3.4	3.90	.5	.000	.005	Very slight trace.	Heavy trace.
888	Brook, Houlton	September 24,	12.2	3.0	11.80	.0	.001	.003	None	Slight trace.
889	Spring, Houlton	September 25,	34.0	7.0	26.62	1.0	.001	.005	None	Much.
890	Water supply, Houlton	September 25,	7.0	4.2	3.90	.1	.001	.013	None	Very slight trace.
891	Spring, Durham	September 26,	3.4	1.8	1.95	.1	.000	.000	Very slight trace.	Much.
892	Spring, Waterford	September 26,	4.2	4.0	2.34	.4	.003	.002	Heavy trace	Slight trace.
893	Well, Anson	September 27,	11.2	8.2	4.86	1.0	.000	.000	Slight trace	Much.
894	Stream, Anson	September 27,	7.0	3.8	3.90	.2	.001	.005	None	Very slight trace.
895	Spring, Yarmouth	September 13,	3.4	2.8	1.95	.4	.000	.006	None	Very slight trace.
896	Well, Portland	October 1,	8.0	2.2	5.30	1.2	.000	.000	Very slight trace.	None.
897	Well, Dixfield	October 4,	11.0	2.6	5.30	.6	.001	.006	Very slight trace.	Very much.
898	Well, Brownfield	October 4,	4.0	3.0	1.95	.3	.002	.002	None	Heavy trace.
899	Well, Brownfield	October 4,	10.2	5.2	2.99	.4	.002	.023	None	Much.
900	Well, Brownfield	October 4,	9.4	6.0	6.00	1.2	.010	.012	Trace	Very much.
901	Well, Brownfield	October 4,	6.2	4.0	3.90	.5	.003	.003	Very slight trace.	Much.
902	Spring, East Gray	October 5,	2.8	2.0	1.95	.3	.001	.000	None	Slight trace.
903	Well, Bowdoinham	October 4,	45.6	13.2	29.68	8.0	.003	.003	Very slight trace.	Much.
904	Well, East Wilton	October 9,	7.6	4.0	3.77	.8	.000	.000	None	Heavy trace.
905	Spring, Yarmouth	October 5,	7.4	2.6	5.64	.8	.000	.000	None	Heavy trace.
906	Well, Washington	October 5,	10.4	5.0	6.71	2.8	.001	.002	Very slight trace.	Heavy trace.
907	Well, Farmington	October 5,	36.2	20.2	13.31	4.8	.000	.003	Very slight trace.	Heavy trace.
908	Well, Peru	October 7,	29.6	11.2	8.44	2.8	.001	.010	Very slight trace.	Very much.
909	Spring, Bangor	October 7,	4.0	3.0	2.99	.4	.000	.005	None	Slight trace.
910	Spring, Bangor	October 7,	4.0	1.8	3.25	.3	.001	.003	Very slight trace.	Slight trace.
911	Well, Brooks	October 10,	4.0	2.6	2.99	.3	.003	.005	None	Slight trace.
912	Well, Saco	October 12,	4.0	2.8	1.95	.8	.002	.000	Very slight trace.	Heavy trace.
913	Well, Gorham	October 16,	18.4	6.6	12.26	1.8	.063	.001	Trace	Much.
914	Well, Gorham	October 16,	18.8	4.2	8.44	1.8	.001	.000	Trace	Very much.
915	Well, Portland	October 17,	53.6	15.2	20.40	12.6	.041	.007	Much	Very much.
916	Well, Pittsfield	October 28,	38.4	18.2	19.60	5.0	.008	.005	Trace	Much.
917	Well, West Bowdoin	November 14,	13.8	3.6	5.00	.8	.011	.006	Trace	Heavy trace.
918	Spring, West Bowdoin	November 14,	4.6	1.4	5.00	.3	.001	.002	Very slight trace.	Trace.
919	Well, Lagrange	November 15,	19.4	7.2	11.80	3.4	.000	.002	Very slight trace.	Much.
920	Lake, Bath	November 6,	2.6	1.8	.79	.4	.005	.013	None	Very slight trace.
921	Spring, Bangor	November 14,	28.0	12.0	10.30	2.4	.000	.003	Very slight trace.	Very much.
922	Well, Bangor	November 15,	45.6	12.4	18.84	10.4	.019	.005	Trace	Very much.
923	Spring, Bangor		19.0	6.8	11.05	1.0	.001	.032	Trace	Trace.
924	Well, Winthrop	November 15,	25.6	8.8	11.05	1.8	.019	.019	Much	Much.
925	Spring, Bowdoinham	December 1,	5.6	5.2	2.60	.4	.001	.002	Very slight trace.	Heavy trace.
926	Reservoir, South Berwick	December 28,	7.4	3.4	3.90	.5	.001	.005	Very slight trace.	Much.

NOTES ON SOME OF THE SAMPLES OF WATER EXAMINED IN THE LABORATORY.

No. 706. From a well twenty-four feet deep and one hundred years old. There are three feet of soil and then an impervious hard-pan. The distance from the privy is forty-six feet, from sink drain cesspool forty feet, and from the stable, barnyard, and pig-pen one hundred feet. The report on the sample says: "It contains considerably more organic matter than a well water should, and the analysis shows a moderate amount of pollution. Since there has been typhoid fever on the premises, I should be afraid that the water may not be safe for persons who have never had typhoid fever, especially if the discharges from the patient went into the privy, or if the wash water from the clothes which were taken off the patient went through the sink drain. The privy, sink drain, and cesspool are too near the well."

No. 716. This is a city well twenty-three feet deep, fifty feet from privy and thirty from sink cesspool, with other sources of pollution too near. "The total solids are very large in quantity; in most of the wells in this State it ranges from three or four to fifteen or twenty parts per 100,000. This you will see has 92.6 parts. If I remember rightly this is the hardest water yet received in the laboratory. The degree of hardness of well waters generally ranges from two or three to up in the twenties in the limestone region of Aroostook. This extreme degree of hardness and the large total solids indicate a larger quantity of mineral matter in the water than there should be in a water to be considered suitable for drinking. The quantity of chlorine present is greater than that which may be considered a normal quantity in well waters derived from the soil in this State. The excess is indicative of pollution from some of the sources that are too near,—all, in fact, are much too near for safety."

No. 728. From a well eighteen feet deep, fifteen feet from privy and stable and from twenty to thirty feet from sink drainage and pig-pen. The soil is sandy. "The water is badly polluted. The privy, stable, and sink drainage are all too near the well."

No. 736. From a well seventeen feet deep, seventy-five feet from the privy and forty-five feet to the place where the sink drain-

age discharges. The sink drain of boards passes within nine feet of the well. The well was dug one year ago through loam and sand and an underlying stratum of clay. "The chemical results of this sample are good; there is but very little organic matter in it; but I fear very much that at times the well receives soakage from the sink drainage, and with the present arrangements I should be afraid that the frequency of pollution would increase as time goes on. There should be a perfectly tight iron pipe drain from your sink to a distance of seventy-five or eighty feet, at least, from the house, if you have room to carry it so far. Although I get good results from this particular sample the fact that the water was good at first and afterwards had a smell 'like a sink spout' is conclusive enough evidence that the sink drainage soaks into the well at times, and I should advise a discontinuance of the use of the water for drinking until some such improvement is made as I have recommended."

Nos. 739 and 740. One of these samples was from a spring six hundred feet from possible sources of pollution and the other from a well twenty-five feet deep and from ten to one hundred feet from sources of pollution. "Reporting on the samples of water sent by you I would say that the sample from the spring (Walnut Butter and Cheese Factory) is of excellent quality for drinking and well adapted for the use for which it is designed. The figures obtained in the analysis are shown in the corresponding blank.

"The sample of water from the well gives results as unsatisfactory as those from the spring are favorable. You will observe that the total solids are high, that it is a very hard water, and the evidences of pollution in the large excess of chlorine and of free and organic ammonia and nitrates are conclusive. The privy, the stable, the barnyard, and even the sink drain are all well within the area of drainage of the well. The water is not a desirable or a safe one for drinking."

No. 749. From an old well twenty-three feet deep and only twenty feet from the privy, pig-pen, and sink drainage. It was dug through a dangerous combination of strata consisting of only two or three feet of sandy loam and then clay. "Its chemical examination shows it to be badly polluted and unfit for drinking purposes."

No. 754. From a well fourteen feet deep, dug through eleven feet mostly of made ground and then sunk three feet into ledge by

blasting. Five families live in houses on the bare ledge six feet higher than the mouth of the well. The well is apparently so located as to receive polluting matter from the privies and the sink drainage of these houses. "I give on a separate sheet the figures obtained from the analysis of a sample of water sent by you in the latter part of August. The results indicate a serious amount of pollution which you could well infer from the very unfavorable surroundings. Your description of the location of the well indicates that all the filthy soakage from the houses and their surroundings have a free run into the well. This water is altogether unfit for drinking."

No. 467. From a well fourteen feet deep with sources of pollution fifty feet distant. "The quality of this sample is fairly good for drinking purposes. The results of the analysis indicate that there is a little soakage through the soil into the well of polluting matter, but it is thoroughly oxidized, and organic matter is therefore destroyed before it reaches the well. But I would advise great care in the management of the privy and sink drainage so as to prevent the soakage into the soil of any polluting matter that might at some time reach the well in a more dangerous form or in greater quantity than is now indicated."

No. 770. From a well dug seventeen feet deep through sandy loam. The distance of the privy is fifty-five feet and of the cesspool for the sink drainage, sixteen feet. "The distances of the privy and sink drainage are altogether too slight to insure protection of the well from pollution. The results of the analysis show that the water is polluted, and it should not be used for drinking purposes, unless it has previously been boiled.

"Another objection to the use of this water is that it contains a trace of lead, undoubtedly derived from the lead pipe through which the water is drawn. I notice that some of the users of the water are subject to attacks of colic and this is often a symptom indicative of lead poisoning."

No. 771. This sample is from a drilled well, fifty feet deep. It is three hundred feet at least from any source of pollution.

"The analysis of the sample of water shows that it is a very good and pure water for drinking purposes with the exception that it contains a trace of lead. It is rather a soft water and for that reason there is more danger of lead poisoning than there would be

if the water were harder. I notice that some of the users of the water are subject to bilious colic. I should apprehend danger of lead poisoning from a constant use of the water, coming through the lead pipe now in use."

No. 773. This water is brought through lead pipe from a spring eighty rods distant and not exposed to any source of pollution. "Analysis shows that the water is good and pure for drinking purposes, with the single exception that it contains a trace of lead. For constant use I should prefer not to use a water for drinking that has any trace of lead in it. If you do continue to use it I should advise letting the water run constantly. By so doing there will be less danger. By discontinuing the use of the water there will, of course, be the least danger. The water is quite hard."

Nos. 772 and 789. These two samples were from the same well. The first sample was sent in a bottle suspected of not being chemically clean and with a dirty cork which it is thought might have increased the organic matter indications. The second sample was sent in one of the bottles of the State Board of Health, known to be chemically clean when it was sent out.

The depth of the well was thirteen feet and though the suspected sources of pollution were more than one hundred feet distant, the ground slopes toward the well.

"The results are rather unfavorable. There is indication of a moderate degree of pollution derived from some source, and since typhoid fever has twice been among the users of the water, this would be an additional cause for regarding the water with suspicion. Boiled, the water would be harmless; unboiled, I should prefer some other supply.

No. 803. This sample is a good example of the waters from the springs in this State when the possibilities of filthy drainage into them is absent. The sample was taken from a spring eighty rods from the buildings. "It is a good and pure water for drinking purposes."

No. 804. This is also from a spring four hundred feet from possibilities of pollution. "The figures obtained in the analysis are shown on the accompanying sheet. They indicate a good and pure water for drinking or other purposes. It is a rather soft water though the degree of hardness is about twice as great as that of most of the river waters in the State.

No. 811. From an old well dug through nine feet of sandy soil; then eight feet through ledge; then last year drilled forty-nine feet more into the ledge. The privy is sixty feet distant, and the sink drainage discharges forty feet from the well.

"I am sorry to say that the sample of water from this well shows plain indications of pollution. A quantity of chlorine more than 2. parts in one hundred thousand casts a suspicion upon well water. In this sample you will see there are 7. parts, that there is a large excess of free ammonia, and that there are much nitrites and nitrates. It is also a hard water and the total solids are indicated by a high figure, although these two results would not forbid, by any means, the use of the water for drinking purposes.

"The sinking of the well through the bottom of the old polluted well was injudicious. From some source or other polluting matter finds its way through the porous soil to the surface of the ledge, and then makes its way into the well. When a drill is passing through a ledge there is no certainty that it is not encountering seams through which polluted matter may find a direct passage to the drilled well below."

Nos. 818 and 819. Two wells driven through sand with occasional thin, hard strata. The depth of 818 is forty-five feet, and of 819 twenty feet. Sources of pollution are within about fifty feet of each well.

The sample from No. 818 is considerably better than that from 819. In the case of 819, the driven well, it is only twenty feet in depth, there is a large quantity of free ammonia which is not a good indication; it at least serves to throw suspicion upon the water when so much is found, even though all the other results were favorable.

Both wells are situated nearer to sources of pollution than even drilled or driven wells should be. The chemical results obtained in the analysis of 818, a well forty-five feet deep, are all favorable. If both wells are upon the same premises, I should by all means use the water from this well.

Nos. 825, 826, 827. In the spring of 1893 an offensive taste and odor appeared in the usually excellent water supply of Bar Harbor, which was supposed to be due to eels in the water pipes. These three samples were sent for analysis in bottles not sent from

this office. The following report was made to the secretary of the local board:

"On the other side of this sheet you will find a tabulation of the results of the analysis of the three samples of water sent by you, together with a report on the analysis of three samples taken from the same water supply in 1888.

"The results of the examination of these last samples show in 825 and 827 a little more organic ammonia, indicating a little more organic matter than existed in 1888. Otherwise the results are just the same.

"This increase in organic matter may be due to slight pollution from some source, or your bottles may not have been chemically clean. Certainly there was in bottle No. 1 (825) an old and dirty stopper which may be the reason why the water in that bottle has more organic matter than either of the others has.

"I, therefore, send three bottles in their packing boxes for three more samples from just the same sources. I will then examine them as soon as possible and report at once.

"But do not depend altogether upon a chemical examination. Make a thorough inspection of the intake of the supply. Notice whether the water has the same taste and smell at all the taps, and whether the water is the same at the lake, the intake, and at the taps. Let me know how it is when you send the second set of samples.

"Notice whether at the intake there is any unusual growth of fresh water algæ; that is, whether there is a green scum or green specks in the water."

The following is the report made on the second set of samples:

"We have just completed the analyses of the second set of samples of water, and the results seem to confirm my suspicion that the indication of an excess of organic matter in two of the other samples was due to a failure to cleanse the bottles as carefully as necessary and to supply them with perfectly clean corks.

"You will notice that the results obtained are quite uniform, and the average results from the three samples are fully as favorable as those made in 1888. If there are really decaying fish in the pipe with which the tap is connected, I should expect it to be shown in the analysis of the water from that source.—Sample No. 3 (825)."

No. 829. From a well in a yard some thirty-five feet from a privy vault and forty feet from the sink drainage which discharges

upon the ground. A rough hard ledge crops out. It is supposed that the soil is thin and that the well was blasted into the ledge.

"The quantity of chlorine in the water is so much in excess of that which is found in any place that I know of in the State where it is derived from the soil in its natural condition that the water must be regarded as polluted, though the organic matter as indicated by the ammonias appears to be fairly well oxidized in passing through the soil. Basing my judgment on the results of the analysis and the history of the surroundings of the well I should not deem this water suitable or safe for drinking purposes."

No. 831. From a spring near the Children's Home in Bangor. "I am glad to be able to report that the sample from this spring at the Children's Home is a very good and pure water for drinking and for domestic purposes generally. The results are shown on the back of this sheet."

Nos. 844, 845, 846. "'A prospective water supply' is the reason assigned for desiring the analysis. You do not, however, state whether it is to be a public or a private supply. In either case, and more strongly if the quest is for a source for a public water supply, I would urge not by any means to be guided in your choice by the results of the analysis of the water from a given source, nor even wholly by the results of a series of analyses.

In seeking a source it is highly important that everything be taken into consideration that may be found on a careful examination of the surroundings of the prospective source. That is, whether anything is discoverable that will probably, or may possibly, pollute the water, constantly or occasionally.

"The figures obtained in the analysis of these samples of water are shown on the back of this sheet. The results do not, in connection with either sample, indicate anything really unfavorable.

"Sample No. 844. From a spring. Considered only from the chemical results, this is more nearly free from all organic matter than either of the other two; but you will note that it is a harder water than 846.

"No. 845. From a spring brook. The organic ammonia, indicative of organic matter, is in larger quantity than is found in many spring brooks. Whether this is the result of any undesirable kind of drainage in the region of the watershed of the brook, such as

the soakage from privies, or sink drains, or the wash from barnyards higher up the valley, only an inspection of the ground will tell.

"No. 846. From a spring. This is a much softer water than either of the other two, and that is quite a desirable advantage, provided a careful personal examination finds no other reason for preferring the water from one of the other sources."

No. 849. This well dug eight feet through the soil and then blasted twenty feet into a ledge, is another example of the popular illusion that the spring or well water which comes from rock must be pure. The chances for purity of water are much greater when no ledge intervenes. In this case the usual sources of pollution, privy, pig-pen, sink drainage, and barnyard, are from sixty-seven to one hundred and fifty feet distant. "The results of the analysis of the sample of water indicate a serious amount of pollution. This water is not suitable for drinking."

No. 850. This is a kind of water that is usually obtained from wells situated as they should be, remote from sources of pollution. This well is only nine feet deep, but it is five hundred feet from buildings or sources of filth. "The figures on the back of this sheet show the results obtained in the analysis of the sample and they indicate a chemically pure and good water for drinking and other domestic purposes. You will note that, for a well water, the total solids are represented by a very small figure, that it is a very soft water,—just about the degree of hardness of the Kennebec or Androscoggin river water,—and that there is an almost complete absence of organic matter as indicated by the figures of free ammonia, organic ammonia, nitrates, and nitrites."

No. 851. From a shallow well thirteen feet deep dug four feet through loose gravel, then through a layer of blue clay, and then into fine, hard gravel. Water thus taken beneath an impermeable stratum would be likely to be pure, if it could be taken without letting the polluted surface water drain downward through the well. The privy, barnyard and sink drainage are all within from sixty to seventy-five feet of this well. The slope of the ground is toward the well.

"The conditions and the surroundings of the well described by you would not lead one to expect it to yield a good water for drinking. Through the four feet of gravel the surface soakage easily passes downward to the impervious layer of blue clay, along the

surface of which it is readily conducted to any downward opening that may be made through it. Under just such conditions as this, foul matter in solution is often carried long distances much greater than that across your whole lot. I cannot, therefore, say whether the source of pollution which you have in mind is the only one existing.

"The results of the analysis show that the water is badly polluted and is unfit for drinking or other domestic purposes, unless it has been boiled. In addition to its pollution with organic matter, it is rather a hard water and has a large quantity of inorganic, or mineral matter, which renders it still less desirable as a drinking water."

No. 875. From a drilled well four hundred and five feet deep at the Maine General Hospital, Portland. "The results indicate a good and pure water for drinking purposes. It is very free from organic matter and for a water obtained from an artesian well of so great a depth, is a rather soft water. Sebago is 1.50 and the waters from the rivers of Maine generally are not quite so soft as that of the Portland public supply."

No. 886. Thirty-eight feet deep through sand, gravel, and clay. "The sample contained but little organic matter, because, as the results make evident, it is nearly all oxidized in passing through the soil to the well; but there is a large excess of chlorine and nitrates, indicative of the infiltration of polluting matter after its organic matter has undergone oxidation. As the distance between the privy and sink drainage on one side, and the well on the other is only twenty-seven feet, there are good reasons to fear that this insufficient body of earth may not at all times be capable of holding back the more objectionable and dangerous forms of pollution. I should deem the well an unsafe one to use unless you can guard absolutely the earth in its vicinity from soakage from the privy and sink drainage."

No. 893. From a well with sources of pollution not less than one hundred to two hundred and twenty-five feet. "This is chemically a good water with the exception that a heavy trace of lead is present. I should think there is danger that lead poisoning may sometime appear in some of the users of the water."

No. 894. From a stream. "This is chemically a good water, more like that from a spring than that from a stream. This will

be a very suitable source for a public supply, provided the quantity is ample and that future sources of pollution are guarded against. As to the present and future danger of pollution, a careful inspection of the watershed of the stream will enable you to judge."

No. 897. From a driven well twenty feet deep dug only four months ago and the ground not previously occupied by buildings. Distance from the privy twenty-five feet, from the sink drainage, thirty feet.

"Even for a driven well the privy and the sink drain are too near, and there will be danger, in time, of polluting matter reaching the well. However, the chemical results of the examination of this sample are favorable and show no indication of the pollution of the water yet. I should by all means advise some system of management of privy and sink drain that will avoid all danger of soakage into the ground from these sources within a radius of a hundred feet at least. The enclosed circular may possibly give some useful hints."

No. 902. From a spring half a mile at least from buildings or sources of pollution. "We make it no part of our work to analyze waters with a view to learning their medicinal qualities. The sample which you sent is a very good and pure water for drinking, and it is safe to say that, if it has any medicinal qualities, it is due to the fact that it is a pure and soft water and that it contains so small a trace of mineral, or earthy matter."

No. 904. From a well thirty feet deep, twenty-five feet from the sink drainage and one hundred feet from other possible sources of pollution. "This sample of water gives excellent results upon analysis, notwithstanding the nearness of certain possible sources of pollution. To insure continued safety I would urge the carrying of the sink drainage through an absolutely tight (preferably iron) pipe to a safe distance. The distance should be at least one hundred feet; a still greater distance would be better."

No. 906. From the village well, sixteen feet deep with sewer running eight feet from the well. "The results of the analysis indicate a water neither very good nor very bad. The quantity of chlorine found in the water has considerable to do in shaping judgment as to the pollution of it. This sample has considerably more than the average good well waters in the State, and I should fear that this excess of chlorine is derived from the sewer. The sewer

is much too near for safety. It should be run a greater distance from the well, or quite a long section as it passes the well should be laid in sewer pipe very carefully cemented. Iron pipe would be better."

No. 912. A driven well twelve feet deep, with a privy thirty-one feet and a wooden, leaky sink spout twelve feet distant. "The privy and sink drain are too near the well for safety even if it is a driven well, but chemically the results are all right and indicate a good, soft, and pure water for drinking. I do not believe you can count on absolute safety from pollution if the contents of the privy vault and the sink drainage are allowed to soak into the ground so near the well. That danger can be avoided by proper management or proper construction of the privy and sink drain. The pamphlets which I send may possibly be helpful."

CIRCULARS AND BLANKS.

The circulars and blanks published by the State Board of Health and kept constantly on hand for the use of local boards of health or other persons who need them, are shown in the following reference list which is in the hands of all the local boards of health:

Form 1.—Blanks for householder's and physician's notification of infectious diseases.
2.—Blank for report to State Board of Health of an outbreak of infectious disease.
3.—Blank for the notification to teachers of infected houses or families.
4.—Blank for re-admission of scholars from houses where there have been infectious diseases.
6.—Form of notice to householders and physicians to report contagious diseases.
7.—Weekly report of infectious diseases.
8.—Special final report.
10.—1st Notice—Nuisance.
11.—2nd Notice—Nuisance.
12.—3rd Notice—Nuisance.
13.—Notice to vacate.
14.—Notice of vacation of premises.
15.—Report to State Board of Health of infectious diseases in neighboring towns.
17.—Blank.—Notification to Physician.

Form 21.—Practical facts about cholera.
23.—Earth closets.
26.—Small-pox, its prevention and restriction.
27.—Does vaccination protect?
29.—Treatment of the drowned.
30.—Contagious and parasitic diseases of animals.
35.—Circular—On cer ain nuisances.
36.—Abstract of the Health Laws.
37.—Circular—Books on Public Health.
38.—Circular—Disinfectants and their uses.
39.—Model By-laws.
40.—Rules for house drainage.
41.—Form for annual report of local board of health.
44.—Diphtheria. (Revised Edition.)
45.—Scarlet Fever. " "
46.—Typhoid Fever. " "
47.—Is Diphtheria contagious?
48.—Isolation of the infectious sick.
49.—Motives and methods for sewering cities, villages, towns, and summer resorts, and for domestic sanitary improvements, house plumbing, etc., etc.—Jordan.
50.—Contagious diseases and contagion.
51.—To teachers.
53.—Characteristics of the Infectious Diseases.
54.—Prevention of Consumption.
56.—Circular to applicants for Water Analysis.
57.—Order blank for circulars.
58.—No ice of the annual meeting of the local board of health.
60.—La Scarlatine.
61.—La Diphtherie.
65.—On building school-houses.
66.—Sanitary improvements: Hints as to some means and methods.
67.—Some points on the Technique of Vaccination.

Report of the Committee on the Pollution of Water Supply appointed by the American Public Health Association.
Water Supply, Public and Domestic.—Webster.
Plans for Heating and Ventilating School-houses.—Woodbridge.
Light Gymnastics for Schools.—Whittier.
Placards for diphtheria and scarlet fever.

AUGUSTA, April, 1893.

To ensure definiteness as to the forms required and the number of each, "order blanks" are furnished to the local boards of health, on the back of which a list of the circulars for easy reference is printed.

The following circulars, new or revised editions, were published in the two years.

[Form 21.]

PRACTICAL FACTS ABOUT CHOLERA.

Issued by the State Board of Health of Maine.

(REVISED EDITION.)

Cholera, as it appears in America, is an exotic disease: that is, it never arises spontaneously on our soil. When it has appeared here, it has always been possible to trace it back to European ports and towns where cholera prevailed, and from there to India, where it always has its origin. Whenever it has left its Asiatic home and overrun Europe, it has invariably, sooner or later, found its way to our own country. In view of the possibility of having to deal with Asiatic cholera in our own Commonwealth, the State Board of Health thinks it prudent to issue this circular.

NATURE OF THE MALADY.

It is a specific disease caused by a specific organic poison, or disease germ, derived directly or indirectly from pre-existing cases of the same disease.

SYMPTOMS.

Cholera almost always begins with a premonitory diarrhœa. Later come vomiting, cramps, exhaustion, and collapse. In some cases the advent of the disease is sudden and its course and termination rapid; in other cases the disease advances no farther than the stage of simple diarrhœa, cases that are fraught with grave danger to the public, as their true character is often overlooked.

HOW IT IS SPREAD.

Cholera is an infectious disease, but it is infectious only in certain ways. It is not "catching," as small-pox and scarlet fever are understood to be. In Calcutta, where cholera is always present, hundreds of cases have been treated in the general hospital, and often in the same rooms with patients sick with other diseases, without ever being a source of infection to them. Physicians and

nurses who care for the sick are little, if any, more liable to take the disease than others. And yet, on the other hand, a single case may poison many other individuals, and give rise to a wide-spread and very fatal explosion of the disease. How can we account for this paradoxical behavior of cholera? In this way: The cholera poison exists principally in the discharges from the bowels and in the vomited matter. If this poison is completely destroyed as soon as it leaves the alimentary canal, there is no danger of the patient's being a source of infection to other persons. But if the dejections are thrown, for instance, into the privy vault, the cholera germs find all the favoring conditions for their development and increase. From the privy vault, or from the surface of the ground, the poison may percolate through the soil, many feet it may be, and gain access to our wells or other water supply.

Let it be distinctly borne in mind that, to take the cholera, you must eat it or drink it. This is not an æsthetic statement of a generally recognized fact, but it is hoped to make it emphatic.

Further facts in relation to the extension of cholera, are these: Privy vaults, cess-pools, sink drains, heaps of manure, filth-sodden earth, and other unclean places, once contaminated with the cholera-germ, may serve as culture grounds for them and for their multiplication, and may remain sources of danger for some time, giving off their infection, which, by being breathed in, may be mixed with the saliva and be swallowed. The infection multiples rapidly in clothing or bedding that has been soiled by the cholera patient, and, without disinfection, remains damp. Hands, soiled never so little with the infection, may, at a touch, infect articles of food and thus spread the disease.

Articles of clothing from cholera regions, especially if soiled with the cholera excreta, may carry *the disease* long distances. During the epidemic of 1873, clothing packed up in Holland, Sweden and Russia, made the ocean voyage and the railway journey with no harm to persons on the way, but started cholera epidemics in the far West when the articles were opened.

Be reassured by the fact that cholera comes not from a mysterious epidemic constitution of the atmosphere, but that it comes, as explained above, in accordance with certain laws which are now well understood. Remembering this, all unneces-

sary alarm may be avoided—only that salutary fear is desirable which shall lead each individual to avoid and remove those conditions which favor not only cholera but typhoid fever and other diseases.

HOW PREVENTED.

When the importation of cholera is threatened, a grave responsibility rests upon State and local authorities. Especially at ports engaged in foreign commerce, vigilance should be constant and action prompt, when required. If cholera should be allowed to effect a landing, the soil and the water may be contaminated and the "stamping out" of the disease made impossible.

SPECIAL RULES.

1. *Experience has abundantly proved that a town or district with a clean soil, pure air, and pure water, may bid defiance to cholera.* The rule is therefore imperative to search for and abate all filth nuisances. Remove all decomposing animal and vegetable substances. Empty all privy vaults; drench them with Solution A. Abolish privy vaults as far as possible, substituting better methods of disposal of excreta. Treat all cess-pools in the same way. Ventilate rooms and keep the cellar dry and well ventilated. Of the greatest importance is an assurance that the water supply is not polluted,—by filthy soakage through the soil in the case of wells; by human excreta from sewers or otherwise in the case of public water supplies.

2. Never neglect the preliminary diarrhœa. During this first stage the disease is usually curable.

3. If possible, burn all discharges coming from the patient, as well as all soiled cloths or other articles that are not too valuable.

4. If the discharges cannot be burned, do not, upon any consideration, throw them upon the ground or into the privy vault. Have them passed into a vessel containing several times their bulk of Solution A or Solution E, and then poured into a deep, narrow hole in the ground remote from all buildings or water supply.

5. All soiled clothes from the cholera patient, before or after death or recovery, should be, as soon as possible, enveloped in a sheet wet with Solution C (1 :1000) or Solution E, carried to the laundry or an outdoor boiler, and boiled immediately.

6. ' Upon the death of a cholera patient, the body should be enveloped immediately in a sheet wet with Solution C (1 :1000) or Solution E, on no account to be afterward opened, and buried privately as soon as possible.

After death or recovery, the room should be fumigated thoroughly by burning sulphur. After remaining closed twenty-four hours, open doors and windows and ventilate thoroughly. Burn all mattresses and other bedding or furniture that has been soiled with excreta or vomited matter, and that cannot be disinfected with boiling water or with steam. Wash floor and walls thoroughly with Solution C (1 :1000) or Solution E. Repaper if need be.

DISINFECTANTS.

SOLUTION A.—For excreta, privy vault, woodwork, and other surfaces.

SOLUTION B.—For excreta, privy vaults.

SOLUTION C.—For clothing, the hands, excreta, vaults, furniture, and woodwork.

SOLUTION D.—For the person, the hands.

SOLUTION E.—For clothing, the hands, the person, excreta.

BOILING.—For clothing.—SULPHUR FUMIGATION.—For use only where liquid disinfectants cannot be used or to supplement other methods.

SOLUTION A.

Chloride of Lime,	6 ounces.
Water,	1 gallon.

Mix. Cost, about three cents, or seventy-five cents a barrel. This is about a three per cent. solution. (Decolorizes and destroys fabrics.)

SOLUTION B. "*Purple Solution.*"

Corrosive Sublimate,	2 drachms.
Permanganate of Potash,	2 drachms.
Water,	1 gallon.

Mix and dissolve. Label, *Poison!* Cost, two or three cents a gallon, when the chemicals are bought by the pound. (Stains fabrics, etc.)

The permanganate of potassium in this solution is used to give it color as a precaution against mistakes. It also, in this quantity, increases the deodorizing qualities of the solution. This is approximately a 1 : 500 solution of the sublimate; therefore, mixed with an equal quantity of water or liquids to be disinfected, it gives us a 1 : 1000 mixture. One ounce of this solution contains very nearly one grain of the corrosive sublimate.

SOLUTION C. "*Blue Solution.*"

Corrosive Sublimate,	4 ounces.
Sulphate of Copper,	1 pound.
Water,	1 gallon.

Mix and dissolve. Label, *Poison!*

This is sixteen times stronger than Solution B, and is intended as a standard solution from which, by dilution with water, a solution of the proper strength for use may be made. To make from it a solution of the proportion of

1 : 500, add 8 ozs. to 1 gallon of water.
1 : 1000, add 4 ozs. to 1 gallon of water.
1 : 2000, add 2 ozs. to 1 gallon of water.

SOLUTION D.

Labarraque's Solution,	1 pint.
Water,	1 gallon

Mix. Cost, about twenty-five cents.

SOLUTION E.

Carbolic Acid, (90 per cent.)	7 ounces.
Water,	1 gallon.

Mix. This is approximately a five per cent. solution, or in the proportion of 1 : 21.

Sulphur Fumigation. To use this effectively three pounds of sulphur should be burned in a room ten feet square. Every opening into the room,—flues, doors, windows, cracks, and crevices, must be closed, except the door by which the disinfector is to escape. The sulphur is to be burned in an iron kettle or other vessel set in a tub containing a little water to guard against fire. Ignite the sulphur with a few live coals or with a little alcohol or kerosene and a match. Leave the room quickly, for the fumes are highly poisonous when breathed, and close the door tightly. Let the room remain closed twenty-four hours or more. Then air thoroughly for several days.

Boiling for at least half an hour is a sure way to destroy infection. Immersion in Solution C (1 : 2000) or in Solution E, one-half strength, will lessen the danger from infected clothing until it can be boiled.

[Form 26.]

SMALL-POX,

Its Prevention and Restriction.

[Revised Edition.]

Issued by the State Board of Health of Maine.

Small-pox is always the result of infection. The specific poison which is the cause of the disease is very active—a momentary exposure to it will often result in producing small-pox in the unprotected, and the vitality of the infection, under certain circumstances, is capable of being preserved a long time. The disease is dangerous and loathsome in the extreme, giving a high death-rate in the unvaccinated, and hideously disfiguring and maiming many who outlive it.

The present generation from its own observation can have no adequate conception of the terrible devastation which this disease caused before the discovery of vaccination. In the large cities one-third of the deaths in children under ten years of age came from small-pox.

"Not a decade passed in which this disease did not decimate the inhabitants in one country or another, or over great tracts of country; so that it came to be more dreaded than the plague."

In France, 30,000 persons died annually from this disease; and in the whole of Europe from 400,000 to 450,000 perished yearly from the same scourge.

In Westphalia, where the death-rate from small-pox was formerly 2,643 in the million of population, the annual morality from the same cause declined to an average of 114 in the million from 1816 to 1850, under the influence of general vaccination. In Berlin the reduction was from 3,422 to 176; in Copenhagen from 4,000 to 200.

In Germany, of late years, under a law making vaccination and revaccination compulsory, the prevalence of small-pox has still further diminished, until it is almost unknown in the empire. For the year 1886, the death-rate from small-pox in the whole country

was only .03 to each 100,000 of the population, and in the two succeeding years a continual and still greater reduction of the small-pox death-rate was effected.

These facts will give us some idea of the benefit which has been conferred upon humanity by vaccination. Without the protection which it affords, nearly, if not quite, the olden fearful rate of mortality would, in the course of a generation or two, be restored. Cleanliness and the observance of the general laws of health might avail a little, but only a little, in restricting this disease, which seems to have its being always in infection.

In a community or town well and thoroughly vaccinated there would be no possibility of a serious extension of small-pox. Neglect of this protection has, even in recent years, sometimes led to very disastrous and unprofitable results. Such a course in Philadelphia, in the winter of 1871-2, cost the city in lives and paralyzed business twenty million dollars. And such neglect of vaccination in Montreal in 1885 imposed a heavy penalty on that city and its surrounding province, and at the same time, seriously threatened the New England states.

PREVENTION.

The all-important preventive measure is vaccination. In the face of the disease, vaccination, isolation and disinfection must go hand in hand.

Every child should be vaccinated in its earliest years, preferably before six months of age, and in case of danger of infection, the vaccination should be done at once, no matter how young the child is. Vaccination should be done again before puberty, better before ten or twelve years of age. Afterward vaccination should be *tried* as often as every six or seven years, or oftener if the person is subjected to probable danger or small-pox contagion.

The operation should be done only by competent physicians, and only with vaccine virus of undoubted reliability and purity, otherwise a sense of security is often felt when in fact protection is not obtained.

Should vaccination be made in only one place or in several? is sometimes asked. The following, based upon the examination of 5,000 cases of small-pox in England, answers the question strongly in favor of inserting the virus in several places in the arm.

Percentage of deaths in :—

1.	Unvaccinated,	35 per cent.
2.	Vaccinated :—	
	Having one vaccine scar,	7.73 per cent.
	Having two vaccine scars,	4.70 per cent.
	Having three vaccine scars,	1.95 per cent.
	Having four vaccine scars,	.55 per cent.

In case of the presence of small-pox immediate and careful vaccination should be made of all persons who have not recently been so protected. Even after known exposure to the disease, vaccination should be done any time before the actual appearance of the eruption. If done within two or three days after exposure it will often prevent the disease, or make it much lighter; and done later there is reason to believe that, even then, it has a salutary effect upon the course of the malady.

When a case appears enforce immediately strict isolation and quarantine of the patient, and this should be continued for at least two weeks after the recovery of the case and after the crusts have all separated. When a patient cannot be removed to a hospital, but must remain in a private house, secure a room, if possible, on the uppermost floor and remove from it all articles and furnishings not absolutely needed. For a nurse, have some person who has been recently and successfully vaccinated or who has had small-pox. Keep all others away from the room. All other persons in the house and neighborhood should immediately be vaccinated. In case of death the funeral should be strictly private and conducted under the direction of the local board of health or health officer.

The disinfection should also be done under the same authority. During the sickness all discharges from the patient should be plentifully treated with Solution A, solution B, or solution C, and then buried. All crusts should be burned.

Clothing should be immersed in solution C, 1 :1000, or solution E, and then subjected to prolonged boiling. All articles which cannot be surely disinfected must be burned.

If death should occur, the body should immediately be wrapped in a sheet wet with solution C, or solution E, and prepared as soon as possible for private burial.

The room and house should be subjected to thorough and prolonged fumigation with sulphur, and renovated with paper, paint and whitewash.

[For Disinfectants see page 52.]

[Form 28.]

FIRST INSTRUCTIONS

To Newly Appointed Local Boards of Health.

As soon as possible after your appointment, meet and legally organize by choosing a secretary and a chairman from your number. Qualification by oath of office is not required. In a book kept for that special purpose, record all your official acts.

Unless a "well-educated physician" acceptable to the board has been appointed health officer by the municipal officers, your secretary will be your executive officer.

Immediately after holding your meeting and organizing, report your membership, and the name and post office address of your secretary and chairman to this office.

The Secretary of the State Board of Health will then send you copies of "Abstract of the Health Laws," and of various circulars and blanks explanatory of your powers and duties.

If you deem it advisable to do so, write to "State Board of Health, Augusta, Maine," for these papers before holding your meeting.

A "Reference List" of the blanks and circulars published by the State Board of Health will be sent to you. From this list order anything you need at any time.

When in doubt as to your powers and duties, or as to methods of doing local sanitary work, write to the State Board for advice, and help will cheerfully be given, as far as possible.

By order of the State Board of Health,

A. G. Young, *Secretary.*

[Form 44.]

DIPHTHERIA,

Its Prevention and Restriction.

[Revised Edition.]

Issued by the State Board of Health of Maine.

Diphtheria is a contagious and infectious disease, attacking persons of all ages, but affecting children much more frequently than it does adults. It may be communicated from the sick to the well by means of persons, or by cups or other articles which pass from mouth to mouth, or through the medium of the air, or it may be spread by means of clothing or other infected things.

That diphtheria is a germ disease is generally accepted. That this germ is capable of retaining its life a long while under favorable circumstances seems to be abundantly shown by the histories of many outbreaks referable to infected clothing or other things which have been laid away without disinfecting, and brought forth or unpacked months or years later. Infected rooms and furniture, also, figure quite often as the origin of outbreaks of diphtheria.

These facts most urgently call for extreme care not to carry or scatter the infection from the sick-room to other parts of the house, or to other houses, nor to overlook a single infectious article when disinfection is done.

The very fact that this contagion is long-lived renders it more difficult to trace it from case to case, and makes it quite likely that many unexplained outbreaks are due to infected things forgotten or unknown.

Again, there are reasons for believing that the infection is capable of multiplying, under favorable circumstances, independently of human or animal organisms, in filthy places about dwellings, for instance, and thus sometimes giving rise to outbreaks.

But no matter how the outbreak has arisen, the law of contagion then tends to carry it to the rich and the poor, the cleanly and the uncleanly, if carelessness prevails.

Diphtheria is a preventable disease. Proper preventive measures are almost invariably followed by the limitation of the disease to the first case or cases. **When diphtheria gets away from the primary cases and makes its escape upon the community, someboby is usually to blame.** The sooner we accept this as a sanitary maxim, the sooner we shall begin to do our duty as individuals and as communities.

PREVENTION.

Keep away from the sources of the contagion. Do not go where the disease is, if you can help it; and, above all, do not let your children go where it is. Permit no one to come to your home who has been where it is.

From the dwelling and its vicinity banish all sources of filth, whether of the ground, of the water, or of the air. The ground under and around the house, if not naturally dry, should be thoroughly and deeply drained.

Diphtheria does not come from far through the air, therefore do not shut up your house tightly, thinking thereby to shut out the disease. By so doing you shut *in* the poison of rebreathed air, which paves the way and makes it easy for the poison of diphtheria to claim your children. Let the sunshine in by day and the pure air both by day and night. When diphtheria is prevalent avoid all crowded gatherings; especially keep children from such places.

What is apparently only a common sore throat in adults will sometimes give rise to an outbreak of diphtheria in children; therefore, in all cases of sore throat, prudence would dictate caution in using dishes which the patients have used. A kiss to a child under these circumstances may be the unconscious seal of the little one's death warrant.

When diphtheria is rife, keep from the children gum, jewsharps, harmonicas and other things which go from mouth to mouth.

Be sure that the drinking water and milk are pure.

RESTRICTION.

As soon as it is found that a person has diphtheria, he should immediately be separated from the rest of the family and put into a sunny and well-ventilated room, preferably on the upper floor,

and as disconnected as possible from other rooms, especially the living and sleeping rooms of children.

Before moving the patient into the room, all needless articles, such as carpets, contents of wardrobes, etc., which would catch the infection should be removed.

No other person beside the nurse and necessary attendants should be permitted in the room, and they should take special precautions not to carry the infection. Their communication with the rest of the family should be as restricted as possible.

The secretary of the local board of health, or the health officer, should immediately be notified and should co-operate with the physician to keep the disease from spreading. Children and parents from other houses should be warned; and, if they needlessly and obstinately persist in coming, they should be driven away.

Neither the nurse nor any other person should eat or drink anything in the sick room or anything which has been there. Food which the patient has left should be burned.

Cats and dogs should be kept from the sick chamber, or better, out of the house, for their fur can easily carry the infection. These animals, as well as some others, sometimes have diphtheria, and communicate it to children.

The dishes which the patient uses should not be used by others, or washed with other dishes. They should be washed by themselves in boiling-hot water.

The utmost care must be taken that the discharges from the mouth, throat and nose do not soil the room or its furnishings. These discharges should be received on pieces of cloth and burned. If this cannot be done they should be thoroughly disinfected with Solution C (four ounces to a gallon of water) or Solution E, followed by boiling. (See page 4.)

The discharges from the kidneys and bowels should be liberally treated with Solution A, Solution B, or Solution C, and not poured into the privy vault, but buried if possible, 200 feet or more from dwelling-houses and water supply.

The bed and body-clothing should not be mixed with the family wash, but should be put into a tubful of Solution C, or Solution E, until ready to boil.

No person from a house where there is diphtheria should go into public assemblies, such as schools, churches, or concerts.

Persons who have had diphtheria should not mingle with the public for some time after the last trace of the disease has left the throat and nose, and then not until they and all their clothing have been thoroughly washed and disinfected.

In case of death, the body should be enclosed in a sheet thoroughly wet in Solution A, Solution C (eight ounces to the gallon of water), or Solution E, and put into a tight coffin, which should not afterward be opened. The funeral should be strictly private, and in no case should children be permitted to be present.

When the room is vacated after recovery or death, disinfect it by using the sulphur fumigation (See page 4); then wash all surfaces with Solution E, or with Solution C (four ounces to one gallon of water), and afterwards with soap and hot water; finally throw open the doors and windows, and ventilate thoroughly.

[For Disinfectants see page 52.]

[Form 45.]

SCARLET FEVER,

Its Prevention and Restriction.

[Revised Edition.]

Issued by the State Board of Health of Maine.

Scarlet Fever, Scarlatina, Scarlet Rash and Canker Rash are several names for one and the same disease. It is very desirable that only the name Scarlet Fever should be in general use, for so many names have wrought much confusion in the popular mind. Sometimes in scarlet fever the fever is high, sometimes mild. Sometimes the eruption is a vivid red rash, sometimes it is barely preceptible. Sometimes the inflammation of the throat is very malignant, sometimes so slight as not to be noticeable. No matter how these manifestations of the disease may vary in different cases, it is all scarlet fever, and one attack prevents subsequent attacks. With children, scarlet fever is one of the most infectious of diseases, although at times it behaves capriciously. Sometimes children who have never had it escape, although freely exposed to its contagion. Again, the slightest momentary exposure may be sufficient to give the disease.

The poison of scarlet fever is very readily conveyed in clothing or other things even long distances. Such cases as these are so common that almost everybody knows of them: A person calls to enquire about his neighbor's child who has this disease, opens the door for just a moment, perhaps does not go in, walks a long way home, and then gives the disease to his own children.

The contagion may be preserved for many months in clothing or in rooms. An article, for instance, a handkerchief or a doll, may be used by a scarlet fever child and then laid away, perhaps a year, and when unpacked give the disease to other children. A letter or a paper sent by mail may bear the disease, the hair of the head or the beard may carry it, when the clothing has been changed and disinfected and this part of the body neglected.

After recovery, for several weeks at least, the scarlet fever patients continue to be a source of danger to others, as long at least as the skin continues to be rough and to give off its branny scales of desquamation, or peeling.

PREVENTION.

In spite of the subtle infectiousness of scarlet fever, preventive measures will be rewarded with marked results. Carefulness can keep the infection from being scattered abroad, and disinfection can utterly destroy its power to do harm.

Keep your children away from the disease and away from persons and things that have been where it is. Keep, also, all who have recently been sick of the disease and all who have been where it is away from your children. Scarlet fever is always a dangerous and often a deadly disease; therefore, it may sometimes be your duty in protecting your children to treat the grossly careless as malefactors. This duty of protecting your family from the danger of scarlet fever is as clear and imperative as would be your obligation to stay the hand that would carry a deadly draught to the lips of your child. One great reason for warding off scarlet fever is that after childhood this disease is not so fatal, and also after childhood the liability to take the disease is very much lessened. It therefore happens that many, escaping the disease in childhood, never have it, although many times exposed to it later in life.

RESTRICTIONS.

The scarlet fever patient should be put into a room by himself. It is better to have the room in the upper story and at a distance from rooms inhabited by children. Before the patient is put into the room, remove everything possible which can catch and retain the poison of the disease, viz: carpets, useless curtains, unused clothing.

Notify the secretary of the local board of health at once.

Have some person specially employed as a nurse, who is not to visit other parts of the house. No other person not needed should be allowed to visit the sick room, especially those who have children of their own or who must go where children are. The nurse while attending the patient should wear only such clothing as can be disinfected by boiling, before she goes to other places.

The room should be ventilated as thoroughly and constantly as possible without incurring the danger of draughts. Especially during convalescence a chill is to be avoided. Ventilation is desirable, both on account of the patient and on account of diluting and letting out the poison of the disease, so that its concentration may not be a danger to others in the house.

Receive the discharges from the throat and nose upon pieces of linen or cotton cloth, which are to be burned immediately.

The discharges from the bowels and kidneys should be disinfected with Solution A, Solution B or Solution C in large quantity, and buried at some distance from the dwelling.

The utmost care should be taken with the clothing of the patient. Do not carry it from the sick room dry. When removed, it should be dipped into a tub of Solution C or Solution E, and afterwards boiled in the solution.

No person from a house where scarlet fever is, should go into public assemblies, such as schools, churches or concerts, or anywhere into the presence of children who have not had the disease. Much of the contagion of scarlet fever is in the scales which are thrown off from the skin during desquamation; it is well to use frequently, during this period, inunction of some oil or other fatty matter to prevent the scattering of these infectious particles.

Persons who have had scarlet fever should never be allowed to go to school or to mingle in any other way with the public for at least five weeks after the disappearance of the fever and the rash, and not then until the clothing is thoroughly disinfected, and the body has received a disinfecting bath, not omitting the head.

In case of death the body should be inclosed in a sheet thoroughly wet in Solution A, Solution C (eight ounces to the gallon of water), or Solution E, and put into a tight coffin, which should not afterwards be opened. The funeral should be strictly private, and in no case should children be permitted to be present.

After recovery or death vacate the room; burn all things which are of but little value; disinfect everything else, which can be so treated, with liquid disinfectants (Solution A, Solution C or Solution E), and afterwards boil; disinfect the room with sulphur fumigation; wash all surfaces with Solution A, Solution C (four ounces of the solution to one gallon of water), or Solution E, and afterwards with soap and hot water; finally throw open the doors and windows, and ventilate thoroughly.

[Third page, "Disinfectants," same as page 52, this Report.]

[Form 46.]

TYPHOID FEVER,

Its Prevention and Restriction.

[Revised Edition.]

Issued by the State Board of Health.

There is a pretty strong conviction in the minds of sanitarians and physicians that typhoid fever is a disease which has but little right to exist in a civilized community. Such thoughts regarding things inevitable and necessary are neither reverential nor profitable, but intelligently directed efforts to diminish the prevalence of typhoid fever have been followed by so large a measure of success that we are justified in regarding it as one of the *unnecessary* diseases.

The prevention of typhoid fever must rest very intimately on a knowledge of its cause, or, at least, on an acquaintance with the known laws in accordance with which that cause operates. The essential cause of this disease is generally believed to be a minute organic germ, which is given off by the sick, and may be transmitted to the well in several ways.

The infectious germ is not thrown off through the breath, nor in the exhalations from the skin, as is the case in some other infectious diseases; but in typhoid fever it is contained in the discharges from the bowels, and, as recent observations indicate, in that from the kidneys. **Hence the proper disposal of the excreta is a matter of the first and highest importance.**

Still another thing which experience seems to teach, and which the public should bear in mind, is that this fever-germ may be, not only developed, but multiplied outside the human body. That the fever patient is in some way a factory for the time being, engaged in producing and throwing off a poison dangerous to other persons, is a matter of common belief: but, of late years, there has come a settled conviction that this poison, or disease germ, as we now call it, may be, and very often is, developed and multiplied to a dan-

gerous extent outside of the human body, when it is once introduced into places which present the favoring conditions of moisture, warmth, and filth. Hence the vital necessity of care not to plant the dangerous seed in soil congenial to it. Such dangerous localities about our homes are ill-kept water-closets, privies, cess-pools, drains, and earth which is saturated with uncleanliness.

The poison of typhoid fever may sometimes be received into the system by breathing it in; but, in undoubtedly the great majority of cases, the disease germ finds its way into the intestinal canal by means of food and drink. Reflection will show, and experience teaches, that there are many ways in which our food and drink may become contaminated with the germs. Some of the more frequent ways are these: The discharges are thrown into the privy or upon the ground, whence they soak, sometimes long distances, through the soil into the family well. The soiled clothes of the patient are washed, and the water carried by a loose and leaky drain which runs too near the well. Some kinds of food and drink are very absorptive of disease germs, and being kept too near the patient, become contaminated through the air. Many cases are known where milkmen, with fever at their own homes, have caused serious outbreaks of the disease among their customers, by keeping the milk, before it was distributed, too near the sick, by diluting it with contaminated water, or even rinsing the cans with the impure water.

So generally is typhoid fever regarded as due to polluted water, that, whenever this disease makes its appearance, we are justified in suspecting pollution of the water supply until the contrary can be pretty clearly shown.

PREVENTION.

What has already been said about the development of the typhoid fever germ and the ways it is taken into the system pretty plainly indicates the line of our endeavor in preventing it.

It is to be borne in mind:

1st. That filth, if it is not the direct cause, is at least the *nidus* (nest) in which the cause, or germ, may be developed.

2d. That the poison is principally given off from the bowels.

3d. That it is usually received into the system in the food and drink, particularly in polluted water.

1. At all times, as well in the absence as during the presence of typhoid fever, let us try to keep our premises and their surroundings as pure and clean as possible. Of all forms of filth none others are so dangerous to our homes as that of the "hole-in-the-ground" privy, and that in and about our sink drains. The former should never be tolerated, nor the latter, either, in its usual forms.

2. All discharges from the fever patient should be received in a vessel containing a pint or more of Solution A, Solution B, or Solution C (see fourth page), and kept covered by the disinfectant three or four hours, and then buried in the earth where they cannot by any possibility find their way into wells, springs, or brooks. **They should never be allowed to mingle with any kind of filth, in a privy or elsewhere.**

All clothing soiled with the discharges from the sick person should be immediately removed from him or from the bed. Disinfect carefully any spots on floor, carpet, or rug accidently soiled. The clothing, both of bed and patient, should be disinfected by dropping it into a tub containing several gallons of Solution C, or Solution E, and should be kept therein until it can be boiled. It is very important that this rule be followed strictly; otherwise the matter on the soiled clothing dries, becomes pulverized, floats in the air, and endangers the attendant. This suggests the reason why washerwomen often take typhoid fever from infected clothing. After the clothing is disinfected it may be washed with safety.

After death or recovery, disinfect the room with sulphur fumigation, followed with washing the floors and other wood-work with Solution A, Solution C, or Solution E.

3. As far as concerns the personal hygiene of nurses and attendants, it may be said that, if the foregoing preventive measures are carefully carried out, there is hardly a possibility of their taking the disease; in fact, under such conditions, cases in which the attendants have taken the disease from the patient are almost if not quite unknown. Typhoid fever goes through families because usually all have been exposed to the disease-producing cause; or the first cases contaminate the water supply, or "seed down" the privy vault and the house-surroundings with the disease germs.

Nurses and others in the family should eat nothing in the room where the patient is, nor anything which has been there. The food

for the attendants and family should be prepared and kept as far from the sick as possible. Thorough boiling will kill all disease germs; so, while the fever is in the house, it is safer to boil all water and milk just before it is used.

CIRCULAR No. 66.

SANITARY IMPROVEMENTS: HINTS AS TO SOME MEANS AND METHODS.

Published by the State Board of Health of Maine.

The object of this circular is to make some helpful suggestions as to the means through which improvements may be made in the method of disposing of excreta from single buildings or groups of buildings, such as railway stations, manufactories, hotels, schools, etc.

Water Carriage—Wherever a sufficient water supply is always available, a water-carriage system is generally preferable, premising, of course, that entry may be had to a sewer, or that a patch or a tract of suitable land can be obtained for the final disposal of the sewage either by downward filtration or by subsoil irrigation.

If individual water-closets are to be used, a flushing-rim short hopper of good shape should be chosen in preference to the wash-out closet or other low-priced bowls. They should be fitted up with as little woodwork as possible,—simply a wooden seat and cover.

Of late years certain styles of water-closet ranges or trough-closets have come into use with satisfactory results. One of these is shown in Fig. 1.

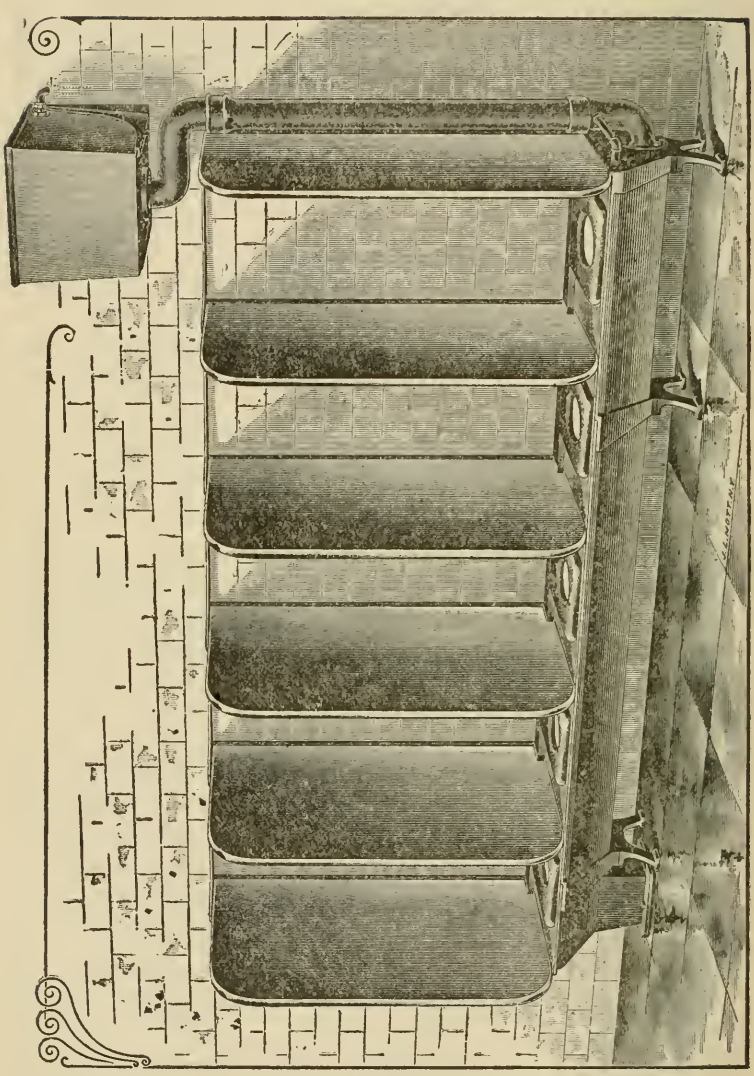


Fig. 1.

These fixtures are provided with an automatic flush that can be arranged at pleasure to act at shorter or longer intervals, or to flush only at certain hours.

Earth Closets.—When a constant and plentiful water supply is not at hand, there is still no excuse for creating a nuisance with a

privy and privy vault of the common kind. A slight expenditure will suffice for the erection of a fixture that may be kept cleanly and unobjectionable with a little care.

Under these conditions the first rule should be to construct a catch-basin or vault entirely above the surface of the ground and easily accessible.

The second rule should be to keep this vault, or catch-basin and its contents in a dry condition by the use of dry earth, or sifted coal ashes.

The simplest form of dry closet is shown in Fig. 2.

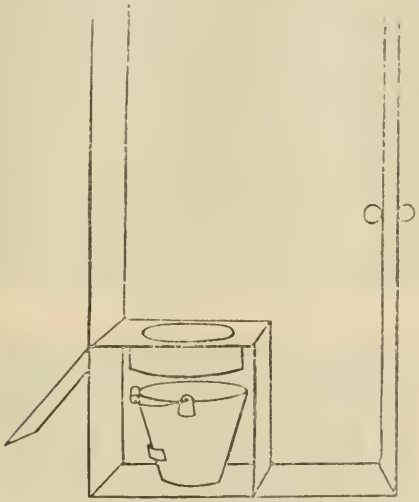
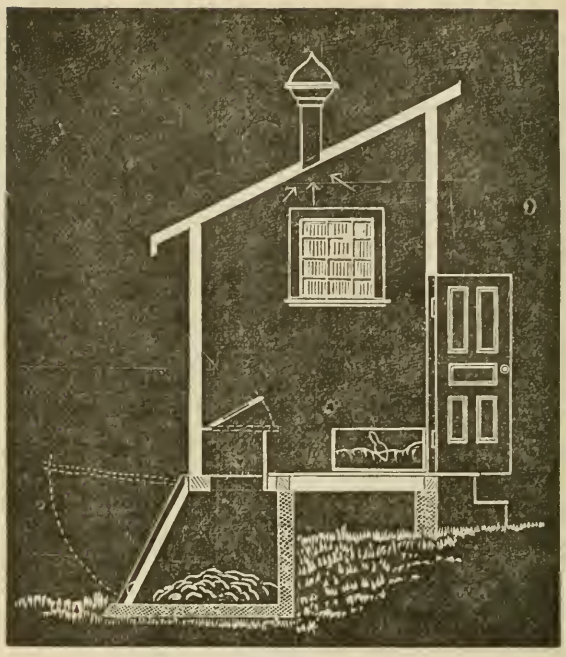


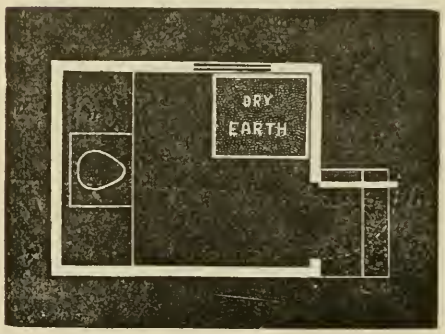
FIG. 2

It consists of a metal-lined box, a galvanized iron pail, and provision for the easy removal of the pail either from the back of the closet, as here shown, or by lifting a hinged seat.

The pail should be removed daily, or at other short intervals, and the contents may be spaded into any available garden patch not too near a well, spring, or other source of water supply.



SECTION.



PLAN

FIG. 3.

Fig. 3 shows a style of earth closet suitable for country railway stations and other places. It has a permanent catch-basin entirely above the surface of the ground built of brick laid in cement and lined with asphalt so that the water or moisture from the soil can have no entrance.

Within the closet is a bin for dry earth or coal ashes and a scoop by means of which it should be somebody's duty to sift

daily or oftener a small quantity of the drying material over the deposit,—enough to keep the whole dry and odorless. At the rear of the vault is a door through which the inoffensive contents may be removed and used as a field or garden dressing.

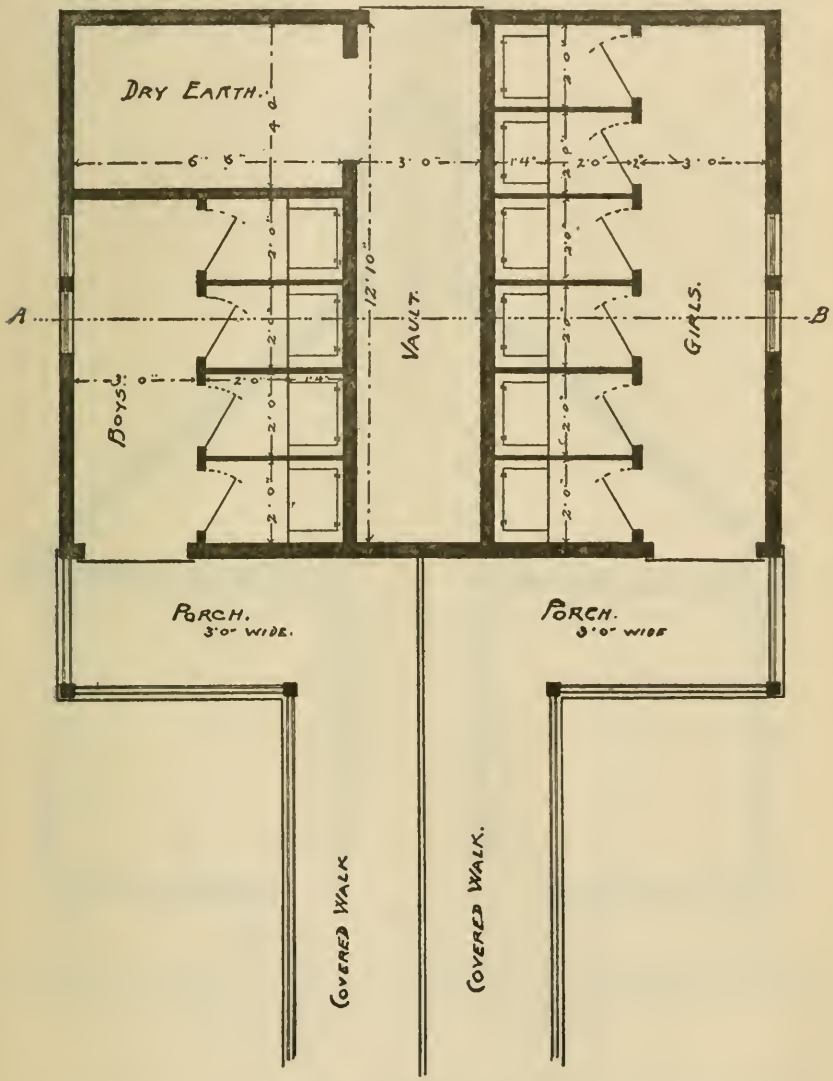
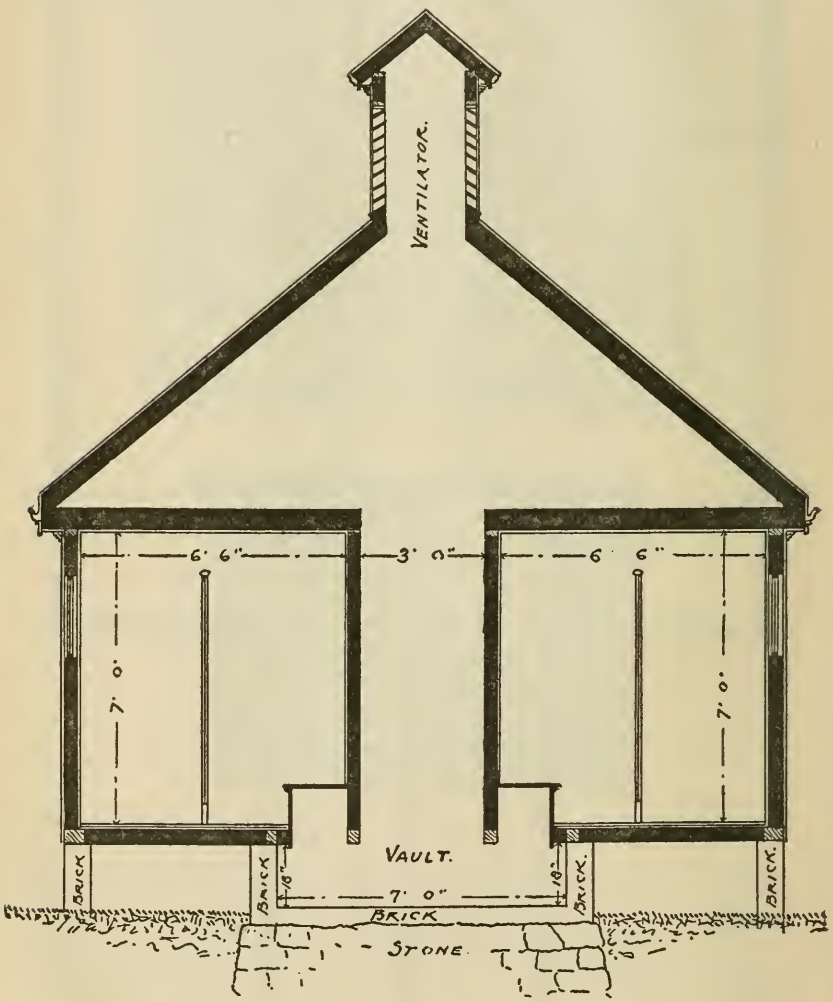


FIG. 4.

Figs. 4 and 5 show a form of dry earth-closet recommended in the Seventh Annual Report for the use of schools. It may easily

be adapted to the wants of various other places in which several seats are to be provided. The following is a description of it:

"In Fig. 4 a double covered walk, separated by a double partition, leads to the porch for the boys' earth-closets on one side, and to that of the closets for the girls on the other. The size of each main closet room is seen at a glance, as well as the several dimen-



SECTION AT A B.

FIG. 5.

sions of the compartments. The closet rooms should be lathed and plastered, or still better, walls and ceiling finished with smooth matched boards. The walk, resting on a frost-proof foundation, is built of brick laid in cement, and cemented and asphalted on the inside. At the back end of the vault there is an entrance for the janitor who is to keep this door securely locked. Near this door is a bin for dry earth.

"It will be seen by the section shown in Fig. 5, that the vault extends under the seat on each side and six inches beyond, and that the boarding back of the seat is carried down to the floor level. The inside of the riser of the seat should be covered with tin or zinc to prevent saturation of the woodwork. The vault is open to the ventilator on the roof. The closet rooms and the vault should be of tight construction so that the circulation of air may be from the seat downward through the vault to ventilator above.

"A shovel should be kept in the vault by means of which the janitor scatters daily a small quantity of dry earth over the deposits,—just enough to keep the compost dry and inoffensive."

No slops in connection with buildings served by dry earth-closets should be poured into the catch-basins. Their disposal may be through a small pipe connecting with sub-surface irrigation tiles, or otherwise as circumstances may demand.

The drying material for any of these forms of dry earth-closet may be common field or garden loam or sifted coal ashes. If earth is used, it should be fine and perfectly dry—so dry that, when stored in a bin, it will not freeze in cold weather. The earth may be dried in the sun by spreading it thinly on a board flooring, or preferably, when used on a large scale, on large sheet-iron pans placed over a slow outdoor fire, or over steam pipes.

Urinals.—Directions are hardly needed for the construction of urinals in connection with a water-carriage system. With earth-closets, the drains from urinals for males may be run into small automatic flushing tanks that discharge their whole contents when they are full into a sub-irrigation drain on a small scale. With this arrangement, if water is used plentifully and often in washing them out, they may be kept in good condition.

Supervision.—Without careful supervision the best forms of water-closets and urinals may become dangerous and offensive, and

earth-closets may become as intolerable nuisances as are ill-kept privies. Water-closets and urinals must be kept clean with an abundant flush and by frequent scrubbing with brush and soap suds. Earth-closet catch-basins must be kept dry by the frequent and regular sifting in of the drying material. Their bowls and seats must also be subjected to frequent scrubbing, permitting as little water as possible to run into the receptacle beneath.

Disinfectants—The proof that careful supervision and cleanliness have done their part is the fact that there is no need of deodorants. When dry earth-closets are properly managed the drying material is an all-sufficient deodorant. As agents for the disinfection of excreta the following are the best:

Chloride of Lime,	6 ounces.
Water,	1 gallon.

Mix.

Recent experiments have shown that "milk of lime" made from fresh unslaked lime, or, in other words, liquid whitewash made in the usual way, is a trustworthy disinfectant for excreta containing typhoid or cholera germs. It is efficient but not so rapid in its action as chloride of lime.

Carbolic acid, more costly than the above, may be used in the following form:

Carbolic Acid (90 per cent.,)	7 ounces.
Water,	1 gallon.

Mix. This is approximately a five per cent. solution.

Instead of carbolic acid, either "Little's Soluble Phenyl" or Creolin may be used. They are both better deodorants than carbolic acid.

CIRCULAR No. 67.

State Board of Health of Maine.

Some Points on the Technique of Vaccination.

As simple a matter as vaccination is, it requires a knowledge of the technique of the operation and the observance of certain precautions which, if wanting, may result in non-success or in an abnormal course of the vaccinal disease.

Use vaccine lymph as fresh as possible. Until wanted for use keep the packet unopened in a cool dry place. Use no lymph that does not bear the date of collection and the propagator's name. Never use lymph which has in it any, even the slightest, admixture of blood.

In opening and handling the points, be careful that their dipped ends come in contact neither with the fingers nor with anything else that may convey foreign matter to them.

Moisten the lymph by dipping the points into sterilized water,—water that has been boiled recently.

Do not sterilize the vaccine lymph as well as other chance disease germs by applying chemical germicides to the arm before or after the operation. Clean clothes, however, are desirable, and a thorough preliminary washing with clean soap and water, of the place to be vaccinated favors a "take."

Automatic vaccinators and other instruments that cannot be cleansed easily and quickly after every vaccination, should not be used.

After every vaccination, the lancet or other instrument in use should be cleansed by dipping it into pure water and wiping it on a clean napkin. When practicable to do so, it is still better to insure full asepsis of the cleansed instrument by dipping it into boiling water or holding it a moment in a flame.

The vaccine should be inserted in several distinct points in the same arm.

It is desirable that each vaccinated child shall be seen again on the seventh day after the vaccination. If the vaccination is then

found to be a failure, revaccination should be done; or if only a single vaccine vesicle is the result, revaccination of the child with lymph from his own arm is advisable.

"Scrupulously observe in your inspections every sign which tests the efficiency and purity of your lymph. Note any case wherein the vaccine vesicle is unduly hastened or otherwise irregular in its development, or wherein any undue local irritation arises; and, if similar results ensue in other cases vaccinated with the same lymph, desist at once from employing it."

Record the names of all persons vaccinated, the date of vaccination, and the results.

Public Health Legislation—1891 and 1893.

CHAPTER 305—LAWS OF 1893.

AN ACT to Provide for the Prevention of the Introduction and Spread of Asiatic Cholera and other Infectious Diseases, and for the more Effective Protection of the Public Health.

Be it enacted by the Senate and House of Representatives in Legislature assembled, as follows:

SECT. 1. The more effectually to protect the public health the State Board of Health shall have power to establish such systems of inspection as in its judgment may be necessary to ascertain the actual or threatened presence of the infection of Asiatic cholera, small pox, diphtheria, scarlet fever or typhus fever; and any duly authorized agent or inspector of said board shall have power to enter any building, vessel, railway car or other public vehicle, to inspect the same and to remove therefrom any person affected by said diseases; and for this purpose he may require the person in charge of any vessel or public vehicle other than a railway car to stop such vessel or vehicle at any place, and he may require the conductor of any railway train to stop his train at any station or upon any side track and there detain it for a reasonable time; provided, that no conductor shall be required to stop his train when telegraphic communication with the dispatcher's office cannot be obtained or at such times or under such circumstances as may endanger the safety of the train and passengers; and provided further, that any such agent or inspector may cause any car which he may think may be infected with said disease to be side tracked at any suitable place and there be cleansed, fumigated and disinfected. And the said board of health may from time to time make, alter, modify or revoke rules and regulations for guarding against the introduction of said diseases into the State; for the control and suppression thereof if within the State; for the quaran-

tine and disinfection of persons, localities, and things infected or suspected of being infected by such diseases; for the transportation of dead bodies when death resulted from said diseases; for the speedy and private interment of the bodies of persons who have died from said diseases; and, in emergency, for providing those sick with said diseases with necessary medical aid and with temporary hospitals for their accommodation and for the accommodation of their nurses and attendants. And the said board may declare any and all of its rules and regulations made in accordance with the provisions of this act to be in force within the whole state, or within any specified part thereof, and to apply to any vessel, railway car, or public vehicle of any kind. The rules and regulations of the State Board of Health, if of general application, shall be published in the official paper of the state; but whenever in the judgment of the board it shall be necessary to do so, special rules and regulations, or orders relating to said diseases may be made for any town, village or city without such publication and the service of copies of such rules, regulations, or orders upon such town, village or city through the officers thereof shall be a sufficient notice thereto; and the rules, regulations or orders of the State Board of Health made in accordance with the provisions of this act shall, from the time being and until the same are revoked, supersede all local rules, regulations, by-laws, or ordinances that may be inconsistent or in conflict therewith.

Sect. 2. All health officers, local boards of health, municipal officers, sheriffs, constables, policemen, and marshals shall enforce the rules and regulations of the State Board of Health made as provided in this act in every particular affecting their respective localities and duties; and any person who shall neglect or refuse to obey the said rules and regulations, or who shall wilfully obstruct or hinder the execution thereof, shall be punished by a fine of not more than five hundred dollars, or by imprisonment in the county jail for a period of not more than six months, or by both fine and imprisonment, in the discretion of the court. And it shall be the duty of all authorities of every county, city, town, and village corporation, and of all local boards of health, and of all officers and persons in charge of the institutions, buildings, and vehicles mentioned in this act to co-operate with the State Board of Health in carrying out the provisions of this act; and in case such co-opera-

tion be refused, withheld, or neglected, the said board shall have power to execute its orders and directions by agents of its own appointment; and all expenses incurred under the provisions of this section shall be paid by the State, the bills first being approved by the governor and council.

SECT. 3. Any rules and regulations adopted by the State Board of Health in the premises shall be immediately submitted by it to the governor and council and unless approved in writing by the governor and council within thirty days after such submission, such rules and regulations shall thereafter become ineffective. Should the governor and council disapprove any rules and regulations so submitted to them within the thirty days and so notify the secretary of the State Board of Health in writing, the rules and regulations so disapproved shall, upon such notification immediately become ineffective and void.

SECT. 4. This act shall take effect the first day of April in the year of our Lord eighteen hundred and ninety-three.

Approved March 29.

CHAPTER 172—LAWS OF 1893.

An Act to amend section thirty-five of chapter fourteen of the Revised Statutes, relating to Vaccination.

Be it enacted by the Senate and House of Representatives in Legislature assembled, as follows:

Section thirty-five of chapter fourteen of the revised statutes is hereby amended by striking out the words, "The mayor and aldermen of any city, and the selectmen of any town or plantation," in the first and second lines and substituting therefor the following: "The board of health of each city, village, town and plantation," so that said section as amended, shall read as follows:

"Section 35. The board of health of each city, village, town, and plantation shall annually on the first day of March, or oftener if they deem it prudent, provide for the free vaccination with the cow pox, of all the inhabitants over two years of age within their respective localities, to be done under the care of skilled practising physicians and under such circumstances and restrictions as said authorities adopt therefor."

Approved February 28, 1893

CHAPTER 82—LAWS OF 1891.

An Act to Protect Waters Used for Domestic Purposes.

Be it enacted by the Senate and House of Representatives in Legislature assembled, as follows:

SECT. 1. Whoever knowingly and willfully poisons, defiles, or in any way corrupts the waters of any well, spring, brook, lake, pond, river or reservoir, used for domestic purposes for man or beast, or knowingly corrupts the sources of the water supply of any water company, or of any city or town, supplying its inhabitants with water, or the tributaries of said sources of supply in such manner as to affect the purity of the water so supplied, or knowingly defiles such water in any manner, whether the same be frozen or not, or puts the carcass of any dead animal or other offensive material into said waters, or upon the ice thereof, shall be punished by a fine not exceeding one thousand dollars, or by imprisonment not exceeding one year.

SECT. 2. Whoever shall willfully injure any of the property of any water company or of any city or town used by it in supplying water to its inhabitants, shall be punished by a fine not exceeding one thousand dollars, or by imprisonment not exceeding one year; and such person shall also forfeit and pay to such water company, city or town three times the amount of actual damages sustained, to be recovered in an action of the case.

SECT. 3. The provisions of all general laws, and of all special acts inconsistent with this act, are hereby repealed.

Approved March 21, 1891.

CHAPTER 213.

An Act to provide against the danger of the spread of Small-Pox from Paper Mills.

Be it enacted by the Senate and House of Representatives in Legislature assembled, as follows:

SECT. 1. No owner, agent, or superintendent of any paper mill where domestic or foreign rags are used in the manufacturing of paper shall hire or admit any person to work in or about said mill who has not been successfully vaccinated or revaccinated within two years, or to the satisfaction of the local board of health.

SECT. 2. No person shall work in or about any paper mill where rags are used, who has not been successfully vaccinated or revaccinated within two years, or to the satisfaction of the local board of health.

SECT. 3. The owner, agent, and superintendent in every paper mill where rags are used shall every year in the months of February and September, make out and deliver to the local board of health, a list containing the names, ages, kind of work, and places of residence of all persons employed in or about said mill.

SECT. 4. In the months of March and October, annually, each and every person who is employed in a paper mill, shall be examined by the local board of health as to whether he or she is successfully and sufficiently protected by vaccination and the local board of health shall in all cases be the judges of the sufficiency of the protection by vaccination.

SECT. 5. Any person who shall violate any of the provisions of this act shall be guilty of a misdemeanor, and upon conviction thereof shall be subject to a fine of not more than fifty dollars.

SECT. 6. It shall be the duty of the local boards of health within their respective jurisdictions and of the State board of health, to enforce this act as far as comes within their power, and when said State board of health knows or has reason to believe that any penalty or forfeiture has been incurred by reason of neglect to comply with said act, it shall, at its discretion, give notice thereof, in writing, to the county attorney of the county in which said penalty or forfeiture has occurred, and upon receipt of such notice the county attorney shall prosecute the defaulting person or persons. Approved February 23, 1889.

CHAPTER 292—LAWS OF 1893.

An Act authorizing and requiring the Inspector of Factories, Workshops, Mines and Quarries to enforce the laws relating to fortnightly payments, sanitary conditions of factories, and to require him to report annually.

Be it enacted by the Senate and House of Representatives in Legislature assembled, as follows:

Section 2. It shall be the duty of the inspector of factories, workshops, mines and quarries to examine into the sanitary condition of factories, workshops, mines and quarries, and when any condition or thing is found that, in his opinion, endangers the health or lives of the employes he shall notify the local board of health, and it shall be the duty of said board to investigate the matter.

CHAPTER 255—REVISED LAWS OF 1893.

An Act in relation to the Inspection of Milk.

Be it enacted by the Senate and House of Representatives in Legislature assembled, as follows:

Sect. 1. Section forty-four of chapter thirty-eight of the revised statutes is hereby amended by striking out the first two lines of said section and inserting in place thereof the following: 'the municipal officers of cities and towns containing not less than three thousand inhabitants shall annually appoint, and the municipal officers of all other towns shall on application of ten voters therein' so that said section, as amended, shall read as follows:

'Sect. 44. The municipal officers of cities and towns containing not less than three thousand inhabitants shall annually appoint, and the municipal officers of all other towns shall on application of ten voters therein, annually appoint one or more persons to be inspectors of milk, who shall, before entering upon their duties, be sworn, and give notice of their appointment by publishing the same for two weeks in a newspaper published in their towns, if any, otherwise by posting such notice in two or more public places therein.'

SECT. 2. Section forty-seven of chapter thirty-eight of the revised statutes, is hereby amended by inserting after the words "has been added" in the fifth line, the words 'or sells or offers for sale as pure milk any milk from which cream has been taken;' and also by adding, after the word "indictment" in the last line of said section, the words 'when milk shall by the gravimetric analysis, be found to contain over eighty-eight per cent. of water, it shall be deemed prima facie evidence that said milk has been watered; and when milk, by the analysis aforesaid, shall be found to contain less than twelve per cent. of solids and less than three per cent. of fat, it shall be deemed, prima facie, milk from which cream has been taken, and any milk which by the analysis aforesaid, shall be found to contain any foreign substance, shall be deemed milk to which a foreign substance has been added,' so that said section, as amended, shall read as follows:

'SECT. 47. Whoever acting for himself, or as the employe of another, knowingly or willfully sells or offers for sale, milk from cows diseased, sick, or fed upon the refuse of breweries or distilleries, or upon any substance deleterious to its quality, or milk to which water or any foreign substance has been added, or sells or offers for sale as pure milk, any milk from which cream has been taken, forfeits twenty dollars for the first, and fifty dollars for every subsequent offense, to be recovered for the town where the offense is committed by complaint and indictment. When milk shall, by the gravimetric analysis be found to contain over eighty-eight per cent. of water, it shall be deemed prima facie evidence that said milk has been watered, and when milk by the analysis aforesaid, shall be found to contain less than twelve per cent. of solids, and less than three per cent. of fat, it shall be deemed, prima facie, milk from which cream has been taken, and any milk which, by the analysis aforesaid, shall be found to contain any foreign substance, shall be deemed milk to which a foreign substance has been added.

SECT. 3. This act shall take effect when approved.

Approved March 24, 1893.

ADDITIONS TO THE LIBRARY.

During the years 1892-93, the following books, journals, and pamphlets were added to the library of the Board by exchange and purchase.

Books.

Bissell. Physical Development and Exercise for Women. New York. 1891.

Blyth. A Manual of Public Health. London. 1890.

Cooke. Laboratory Practice. New York. 1891.

Coplin and Bevan. A Manual of Practical Hygiene. Philadelphia. 1893.

Davis. Potable Water. Boston. 1891.

De Forest. Tuberculosis as a Local and Contagious Disease in New Haven. 1891.

Fall. Laboratory Manual. Boston. 1892.

Haviland. The Geological Distribution of Disease in Great Britain. London. 1892.

Lehmann. Methods of Practical Hygiene. London. 1893. 2 vols.

Sajous. Annual of Universal Medical Sciences. 1891, 1892, 1893. 5 vols. each.

Shakespeare. Report on Cholera in Europe and India. Washington. 1890.

Stevenson and Murphy. Treatise on Hygiene. Philadelphia. Vol. II. 1893.

Stokes. Fresh Water Algæ and the Desmids of the U. S. Portland, Conn. 1893.

Index Catalogue of the Library of the Surgeon-General's Office. Washington. Vol. XIII, 1892. Vol. XIV, 1893.

Reports and Papers of the American Public Health Association. Vols. XVII and XVIII.

Agriculture of Maine. 1891.

Department of Agriculture. Bureau of Animal Industry. Texas or Southern Cattle Fever. Washington. 1893.

Transactions of the Sanitary Institute of Great Britain. Vols. VIII, IX, X, XI, XII, 1886-91.

Transactions of the Epidemiological Society of London. Vol. IX, 1889-90 and Vol. X, 1890-91.

Transactions of the New York Academy of Medicine, Vols. VII, VIII, IX, 1891-93.

Transactions of the Maine Medical Association. Vol. XI, Parts I, II.

Transactions of the Rhode Island Medical Society. 1892.

Transactions of the Medical Association of Alabama. 1892, 1893.

Transactions of the State Medical Association of Texas. 1892.

Reports.

Alabama. Reports of the State Board of Health. 1890, 1893.

California. Twelfth Biennial Report of the State Board of Health. 1891-92.

Connecticut. Fourteenth, Fifteenth and Sixteenth Annual Reports of the State Board of Health. 1891, 1892, 1893.

Delaware. Sixth and Seventh Biennial Reports of the State Board of Health. 1888-90, 1890-92.

Florida. First and Fourth Annual Reports of the State Board of Health. 1890, 1894.

Hawaii. Biennial Report of the Board of Health. 1891.

Illinois. Annual Reports of the State Board of Health. 1889, 1890, 1891.

Indiana. Tenth, Eleventh and Twelfth Annual Reports of the State Board of Health. 1891, 1892, 1893.

Iowa. Sixth Biennial Report of the State Board of Health. 1890-91.

Kansas. Seventh and Eighth Annual Reports of the State Board of Health. 1891, 1892.

Maryland. Ninth and Tenth Biennial Reports of the State Board of Health. 1890-91, 1892-93.

Massachusetts. Twenty-Third and Twenty-Fourth Annual Reports of the State Board of Health. 1891, 1892.

Michigan. Seventeenth, Eighteenth and Nineteenth Annual Reports of the State Board of Health. 1889, 1890, 1891.

Minnesota. Fourteenth Report of the State Board of Health. 1891-92.

Nebraska. Biennial Report of the State Board of Health. 1891-92.

New Brunswick. Seventh Annual Report of the Provincial Board of Health. 1893.

New Hampshire. Tenth, Eleventh and Twelfth Annual Reports of the State Board of Health. 1891, 1892, 1893.

New Jersey. Fifteenth, Sixteenth and Seventeenth Annual Reports of the State Board of Health. 1891, 1892, 1893.

New York. Twelfth and Thirteenth Annual Reports of the State Board of Health. 1891, 1892, (2 vols.).

North Carolina. Third and Fourth Biennial Reports of the State Board of Health. 1889-90, 1891-92.

Nova Scotia. First Annual Report of the Board of Health. 1893.

Ohio. Sixth and Seventh Annual Reports of the State Board of Health. 1891, 1892.

Oklahoma. First Biennial Report of the Territorial Board of Health. 1891-92.

Ontario. Tenth and Eleventh Annual Reports of the Provincial Board of Health. 1891, 1892.

Pennsylvania. Seventh and Eighth Annual Reports of the State Board of Health. 1891, 1892.

Rhode Island. Fourteenth Annual Report of the State Board of Health. 1891.

Washington. First and Second Annual Reports of the State Board of Health. 1892, 1893.

West Virginia. Biennial Report of the State Board of Health. 1891-92.

Boston, Mass. Twentieth, Twenty-First, and Twenty-Second Annual Reports of the Health Department. 1891, 1892, 1893.

Brooklyn, N. Y. Report of the Department of Health. 1893.

Burlington, Vt. Annual Report of the Health Officer. 1892.

Fall River, Mass. Annual Reports of the Board of Health. 1891, 1892.

Hartford, Ct. Sixth and Seventh Annual Reports of the Board of Health, 1891, 1893.

Lowell, Mass. Thirteenth, Fourteenth and Fifteenth Annual Reports of the Board of Health. 1890, 1891, 1892.

Lynn, Mass. Twelfth and Thirteenth Annual Reports of the Board of Health. 1891, 1892.

Manchester, N. H. Annual Reports of the Board of Health. 1891, 1892, 1893.

Mansfield, O. Fourth Annual Report of the Health Department. 1891.

Memphis, Tenn. Thirteenth and Fifteenth Annual Reports of the Board of Health. 1891, 1893.

New Haven, Ct. Nineteenth, Twentieth and Twenty-First Annual Reports of the Board of Health. 1891, 1892, 1893.

Newport, R. I. Seventh and Eighth Annual Reports of the Board of Health. 1891, 1892.

Newton, Mass. Annual Reports of the Board of Health. 1891, 1892, 1893.

New York, N. Y. Annual Report of the Health Officer. 1892.

Norfolk, Va. Annual Report of the Health Department. 1893.

Portland, Me. Seventh and Eighth Annual Reports of the Board of Health. 1892, 1893.

Providence, R. I. Ninth and Tenth Annual Reports of the Superintendent of Health. 1891, 1892.

St. Paul, Minn. Annual Reports of the Commissioner of Health. 1892, 1893.

San Francisco, Cal. Reports of the Health Department. 1892, 1893.

Taunton, Mass. Annual Report of the Board of Health. 1891.

Winona, Minn. Annual Report of the Board of Health. 1893.

Massachusetts. Fiftieth Registration Report. 1891.

Michigan. Twenty-Fifth Registration Report. 1891.

Minnesota. Third Biennial Registration Report. 1890-91.

New Hampshire. Eleventh Annual Registration Report. 1890.

New Jersey. Fourteenth Registration Report. 1890.

Ontario. Registration Reports. 1890, 1891.

Vermont. Thirty-sixth Registration Report. 1892.

Providence, R. I. Thirty-Seventh Annual Registration Report. 1891.

Annual Reports of the Chief of the Massachusetts District Police. 1890, 1891, 1892.

Report of the Fifth Annual Meeting of the Association of Executive Health Officers of Ontario, held at Owen Sound, August 19-21, 1890.

Report of the Sixth Annual Meeting of the Association of Executive Health Officers of Ontario, held at Trenton, August 18-20, 1891.

Report on Disposal of Sewage by the Association of Executive Health Officers of Ontario.

Annual Report on the Health of the County Borough of Sheffield. 1892.

Annual Reports on the Sanitary State of the City of Montreal. 1890, 1891, 1892.

Annual Report of the Supervising Surgeon-General, M. H. S. Washington. 1891.

Report of the Surgeon General of the Army to the Secretary of War. Washington. 1892.

Twenty-Seventh Annual Report of the Victoria General Hospital. 1893.

Special Report on the Prevalence of Typhoid Fever at Cumberland, Md. 1891.

Report of the Quarantine Physician to the State Quarantine Board of Pennsylvania on Eight Cases of Beri-Beri. 1893.

Report of Special Committee of New York Board of Trade and Transportion on Quarantine. New York. 1893.

Report of Committee on Physical Training. Boston. 1890.

Report of Director of Physical Training. Boston. 1891.

Third Biennial Report on the Asylum and Training School for the Feeble-Minded of the State of Maryland. Owing Mills, Baltimore County, Md. 1893.

Second Annual Report of the Commissioner of Lunacy. New Hampshire. 1891.

Report of the Sixth Annual Convention of the International Association of Factory Inspectors of North America, held at Hartford, Ct., Sept. 6-8, 1892.

Annual Reports of the Boston Water Board. 1885, 1888, 1889, 1891-92, 1893.

Eighteenth Annual Report of the Lowell Water Board. 1890.

Report of a Recent Sanitary Inspection of one of the Sources of the Croton Water Supply. New York. 1893.

Report of an Investigation of the Public Water Supply of Cincinnati. Columbus, O. 1892.

Report of the Sewer Commissioner. Canton, O. 1893.

Sixth Annual Report of the Agricultural Experiment Station, University of Nebraska. 1892.

Bulletin of the Agricultural Experiment Station, University of Nebraska. 1893.

Annual Report of the Superintendent of Public Instruction. Brooklyn, 1891.

Report of the Superintendent of the School Committee. Bangor. 1891-2.

Braungart. Der gegenwärtige Standpunkt der Stadte-Reinigungs-Frage und die Einfuhrung des Schwemmkanalisations-Systems in München. Freising. 1890.

Coni. Causes de La Morbidite et de la Mortalite de la Premiere enfance a Buenos Ayres. 1886.

Dollinger und Suppan. Ueber die Körperliche Erziehung der Jugend. Stuttgart. 1891.

Feret. Essai sur L'Hygiene Scolaire. Paris. 1890.

Furst. Der gegenwärtige Stand der animalen Vaccination. Leipzig. 1891.

Hinträger. Bau und Einrichtung von Pflege-und Erziehungsanstalten für die Jugend. Wien. 1892.

———. Das Modern Volksschulhaus. Wien 1891.

Kedzie. El Terreno de Seguridad. Mexico. 1892.

Müller. Zur Einfuhrung der Schwemmkanalisation in München. München. 1891.

Pettenkofer. Die Verunreinigung der Isar durch das Schwemmsystem von München. München. 1890.

Dr. Prausnitz et al. Die Zulassigkeit der direkten Einleitung der Fakalien in die Isar für die Stadt München. München. 1890.

Richter. Grundriss der Schulgesundheitspflege. Berlin. 1893.

Annuario Estadistico de la Ciudad de Buenos Aires. 1891.

Boletin del Consejo Superior de Salubridad. Mexico. Vol. I. 1892.

Codigo Sanitario de los Estados Unidos Mexicanos. Mexico. 1892.

Hygienischer Universal-Schreibstuhl. Basle. 1890.

Wie Soll der Mensch Sitzen? Basle. 1891.

Abbott. Water Supply and Sewerage. Boston. 1892.

Bell. Condition of Articulation Teaching in American Schools for the Deaf. Boston. 1893.

Biggs. History of Recent Outbreak of Epidemic Cholera in New York. 1893.

Billings. Original Research in Relation to Animal Economics. Philadelphia. 1891.

———. A Public Scandal *re* Swine Plague. Lincoln, Neb. 1892.

———. Original Investigations of Cattle Diseases in Nebraska. 1892.

Bobrick. Hygienic Requirements of School Furniture. New York. 1892.

Burnham. Outlines of School Hygiene. Worcester, Mass.

Chancellor. Observations on Cholera and Quarantine. Baltimore.

Chrisman. The Hearing of Children.

Curier. Self-Purification of Flowing Water and the Influence of Polluted Water in the Causation of Disease.

Delano. Twenty-Years' Practical Experience of Natural Asphalt and Mineral Bitumen. London. 1893.

Devonshire. The Purification of Water by Means of Metallic Iron. Philadelphia. 1890.

Dunham. The Bacteriological Examination of the Recent Cases of Epidemic Cholera in the City of New York. 1893.

Dupree. Disposal of Sewage. 1891.

Edwardes. Vaccination and Small-pox in England and other Countries. London. 1892.

Enebuske. Progressive Gymnastic Day's Orders. Boston. 1890.

———. Observations on the Results of the Pedagogical Gymnastics of the Ling System. Boston. 1893.

Fitz. Problems of Physical Education. 1893.

Gerhard. Architecture and Sanitation. New York. 1890.

———. Hints to Gas Consumers on the Proper Use and Management of Gas. New York. 1892.

Gerrish. The Remedial Uses of Hypnotism. Portland. 1892.

Gillespie. The Claims of Sanitary Science upon the Clergy. London. 1891.

Gould. The Duty of the Community to Medical Science. Philadelphia. 1893.

———. The Pernicious Influence of Albinism upon the Eye. Philadelphia. 1893.

———. The Spelling of Some Medical Words. Philadelphia. 1893.

Holt. An Epitomized Review of the Principles and Practice of Maritime Sanitation. New Orleans. 1892.

———. Pestilential Foreign Invasion as a question of States' Rights and the Constitution. New Orleans. 1892.

Johnston. On the Collection of Samples of Water for Bacteriological Analysis.

Klebs. The Treatment of Tuberculosis with Tuberculocidin. Zurich.

Lee. Injuries to the Sacro-Iliac Junction. Philadelphia. 1891.

———. Responsibility of the National and State Governments for the protection of the Purity of Water Supplies. Philadelphia. 1892.

Lincoln. Report of the Committee on School Hygiene. Chicago. 1893.

Mead. Notes on the Hydro-Geology of Illinois in relation to its Water Supplies. Rockford, Ill. 1893.

Monroe. Comenius, The Evangelist of Modern Pedagogy. Palo Alto. 1892.

———. Examinations and Promotions in the Schools of California. Palo Alto. 1892.

Moore. Ventilation of School Buildings in Massachusetts. Chicago. 1893.

Morse. Disposal of the Garbage and Waste of the World's Columbian Exposition. 1893.

———. Latrines of the East. 1893.

Morton. Vaccination.

Peale. Mineral Waters. Washington. 1892.

Popp and Becker. The Sterilization of Milk, etc. Frankfort-on-the-Main. 1893.

Rafter. On the Hydraulics of the Hemlock Lake Conduit of the Rochester, N. Y. Water Works.

———. On the Measures for Restricting the Use and Waste of Water in Force in the City of Rochester, N. Y.

———. On Some Recent Advances in Water Analysis and the Use of the Microscope for the Detection of Sewage Contamination. Washington. 1893.

Reynolds and Hazen. The Water Supply of Chicago. 1893.

Scudder. Seating of Pupils in the Public Schools. Boston. 1892.

Smith. Mind Evaluation for Teaching Purposes. New York. 1893.

Suiter. The Public Health and Some of the Relative Inconsistencies of the National Government. Herkimer, N. Y. 1892.

Ward. Water Supply of Cities. Troy, New York. 1892.

American Public Health Association. Disposal of Waste and Garbage.

———. The Necessity for More Stringent Legislation to Repress Empiricism. 1891.

———. Vaccinal Protection of Passengers from Europe.

———. Report of the Committee on the Cause and Prevention of Diphtheria. Charleston. 1890.

Bureau of Education. Promotions and Examinations in Graded Schools, Washington. 1891.

———. Sanitary Conditions for School Houses. Washington. 1891.

———. Higher Education in Indiana. Washington. 1891.

Department of Agriculture. The Fermentations of Milk. Washington. 1892.

———. Extent and Character of Food Adulterations. Washington. 1892.

———. Treatment of Lumpy-Jaw or Actinomycosis in Cattle. Washington. 1893.

———. A Revision of the Adult Cestodes of Cattle, Sheep and Allied Animals. Washington. 1893.

Zymotic Diseases in Chicago. Springfield, Ill. 1893.

Defence of the Ports and Frontier Cities of Mexico Against the Epidemic of Cholera. Mexico. 1892.

The Cremation of Garbage. Boston.

Warming and Ventilation of the High School Building. Lynn, Mass. 1893.

Germicidal Value of Steam Heat in Maritime Sanitation. Charleston, S. C. 1892.

The Right Application of Heat to the Conversion of Food Material. Indianapolis, Ind. 1890.

Catalogue of Exhibits of Museum of Hygiene. Medical Department of the United States Navy. Washington. 1893.

Proceedings of the National Conference of State Boards of Health held at Washington, D. C., May 2-4, 1891.

Proceedings of the Conference of State and Provincial Boards of Health of the United States and Canada, held at Lansing, Mich, 1892.

Proceedings of the National Conference of State Boards of Health held at New York City, April 5, 1893.

Proceedings of the Fourth State Sanitary Convention of Pennsylvania held at Norristown, May 9-10, 1890.

Proceedings of the Sixth State Sanitary Convention held at Erie, Pa., March 29-31, 1892.

Proceedings of the State Sanitary Convention held at San Francisco, April 17, 1893.

Proceedings of the Connecticut Medical Society. Ninety-ninth Annual Convention. 1891.

Proceedings of the Florida Medical Association, Key West. 1892.

Proceedings and addresses at a Sanitary Convention held at Centreville, Mich., January 15-16, 1891.

Proceedings and addresses at a Sanitary Convention held at Niles, Mich., February 5-6, 1891.

Proceedings and addresses at a Sanitary Convention held at Negaunee, Mich., August 13-14, 1891.

Proceedings and addresses at a Sanitary Convention held at Iron Mountain, Mich., October 30-31, 1891.

Proceedings and addresses at a Sanitary Convention held at Holland, Mich., March 3-4, 1892.

Proceedings and addresses at a Sanitary Convention held at Menominee, Mich., April 5-6, 1892.

Proceedings and Addresses at a Sanitary Convention held at Stanton, Mich., April 27-28, 1893.

Proceedings and Addresses at a Sanitary Convention held at Hillsdale, Mich., July 6-7, 1893.

Proceedings of the Ninth and Tenth Annual Conventions of the National Confectioners' Association of the United States. 1891-92, 1892-3.

Proceedings of the Ninth Convention of the National Association of officials of Bureaus of Labor Statistics in the United States, held at Denver, Colo., May 24-28, 1892.

Manual of Health Laws of Ohio. 1892.

Laws relating to Public Health. Indiana. 1891.

Laws relating to Public Health. Colorado. 1893.

Manual of Statutes of Connecticut relating to Public Health. New Haven. 1893.

United States Quarantine Laws and Regulations. 1893.

Public Health Laws. Province of Ontario. 1893.

Regulations of the State Quarantine Board of Pennsylvania. 1893.

The Book of the Rules of the Medical Association of Alabama. 1889.
Local Boards of Health in the State of New York. 1892.
Alphabetical List of Medical Practitioners in Connecticut.

Sanitary and Other Journals.

Index Medicus. Detroit and Boston. 1892-3.
The Sanitarian. Brooklyn, N. Y. 1892-3.
The Annals of Hygiene. Philadelphia. 1892-3.
The Engineering Record. New York. 1892-3.
The Sanitary Record. London. 1892-3.
Public Health. London. 1892-3.
Architecture and Building. New York and Chicago. 1892-3.
Brooklyn Medical Journal. Brooklyn, N. Y. 1892-3
Medical News. Philadelphia. 1892-3.
The Lancet. London. 1892-3
The Microscope. Washington, D. C. 1892-3.
The American Monthly Microsopical Journal. Washington. 1892-3.
Archives of Pediatrics. Philadelphia. 1892-3.
Modern Medicine and the Bacteriological World. Battle Creek, Mich. 1892-3.
Science. New York. 1892-3.
Medical Times. New York. 1892-3.
Canada Health Journal. Ottawa. 1892.
Occidental Medical Times. Sacramento. 1892-3.
Medical Standard. Chicago. 1892-3.
Medical Review. Pittsburgh. 1892-3.
Abstract of Sanitary Reports. Washington. 1892-3.
Revue D'Hygiene. Paris. 1892-3.
Journal D'Hygiene Populaire. Montreal. 1892.
Archiv für Hygiene. Munich and Leipzig. 1892-3.
Zeitschrift für Hygiene. Berlin. 1892-3.
Vierteljahrsschrift für öffentliche Gesundheitspflege. Braunschweig. 1892-3.
Deutsche Medicinische Wochenschrift. Berlin. 1892-3.
Zeitschrift für Schulgesundheitspflege. Hamburg. 1892-3.
Arbeiten aus dem kaiserlichen Gesundheitsamte. Berlin. 1892-3.
Centralblatt für Bakteriologie und Parasitenkunde. Jean. 1892-3.

Schweizerische Blätter für Gesundheitspflege. Zurich. 1892-3.
Veröffentlichungen des kaiserlichen Gesundheitsamtes. Berlin. 1292-3.
Giornale della Reale Societa Italiana D'Igiene. Milano. 1892-3.
La Salute Pubblica. Perugia. 1892-3.
Hygienische Rundschau. Berlin. 1892-3.
Public Health in Minnesota. Red Wing. 1892-3.
Monthly Bulletin of the Iowa State Board of Health. Des Moines. 1892-3.
Bulletin of the State Board of Health of Tennessee. Nashville. 1892-3.
Bulletin of the North Carolina Board of Health. 1892-3.
Monthly Bulletin of the State Board of Health of Rhode Island. 1892-3.
Monthly Sanitary Record, State Board of Health of Ohio. 1892-3.
Florida Health Notes. 1892-3.
American Analyst. New York. 1892-3.
The National Popular Review. Chicago. 1892-3.
The Journal of Balneology. New York. 1892-3.
The Satellite. Philadelphia. 1892.
The Universal Medical Journal. Philadelphia. 1893.
The Doctor of Hygiene. New York. 1893.

EXPENSES OF THE BOARD.

The amount and character of the expenditures of the Board for the year 1892 were as follows:

Engraving and drawing	$ 29 54
Books and sanitary journals	108 40
Stationery	173 17
Postage	163 50
Printing and binding	1,042 96
Secretary's salary	2,000 00
Expenses of members	343 62
Express and telegraph	113 50
Expenses of Secretary	104 85
Clerical help	660 48
Chemical and microscopical supplies	35 34
Help other than clerical	162 00
Miscellaneous	62 40
	$4,999 76

The expenses for the year 1893 are shown in the following statement:

Engraving and drawing	$ 2 35
Books and sanitary journals	356 67
Stationery	88 07
Postage	326 49
Printing and binding	819 02
Secretary's salary	2,000 00
Expenses of members	429 84
Express and telegraph	111 58
Expenses of Secretary	318 38
Clerical help	381 56
Chemical and microscopical supplies	17 22
Help other than clerical	50 00
Office furnishings	26 00
Miscellaneous	17 35
	$4,944 53

Abstracts from the Reports of Local Boards of Health.

Abbot.

1892. We have had no infectious diseases.—J. B. Greenleaf, Sec. 1893. The past year has been very healthy in our town, with no epidemics excepting la grippe.—F. H. Weymouth, Sec.

Acton.

1892. No nuisances were reported to the board. We had two cases of diphtheria and two of typhoid fever, but no deaths from either disease. Measles, pneumonia and diarrhœa were unusually prevalent. Sewerage and a public water system at Milton Mills would be a sanitary improvement. When cholera threatened we had a special meeting of the board and arranged to be ready for any cases that might appear.—Dr. G. A. Allen, H. O.

1893. No cases of infectious diseases except one of typhoid fever and a few cases of measles.—Bodwell J. Grant, Sec.

Addison.

1892. No nuisances reported to the board. Five cases of scarlet fever in four houses.

1893. There have been no nuisances reported. We have had nine cases of scarlet fever and four of typhoid fever. When cases of infectious diseases have appeared, houses have been placarded and finally have been thoroughly cleansed.—U. W. Curtis, Sec.

Albany.

1892. We have had a few cases of scarlet fever in a very mild form. There is a schoolhouse in our town with a privy on the back of the ell, the door of which opens within six or seven feet of

the schoolroom. Should this be so? [No! it is a condition decidedly dangerous for the pupils. Even if managed as well as possible the distance is much too small. A. G. Y.] D. Clark, Sec.

1893. No nuisances reported. Five cases of scarlet fever, and whooping cough has prevailed. Infected houses have been quarantined.—George W. Beckler, Sec.

Albion.

1892. Two nuisances reported to the board were removed. One case of diphtheria, four of scarlet fever, and four of typhoid fever. Infected houses have been placarded and disinfected. Pneumonia was very prevalent in the spring as a sequel to la grippe, and measles prevailed at the same time.—C. W. Abbott, Sec.

1893. Two nuisances were removed. There was one case each of diphtheria, scarlet fever, and typhoid fever.—F. E. Withee, Sec.

Alexander.

1892. No nuisances have been reported to the board and there have been no contagious diseases of any kind. I am glad to report that the town stands well in that respect.

1893. The board this year has been called upon neither on account of public nuisances nor infectious diseases.—A. H. Perkins, Sec.

Alfred.

1892. No action of the board has been required on account of nuisances, but one case of diphtheria and one of typhoid fever, all that were reported, were properly looked after by the members.—Dr. C. E. Lander, Sec.

Alna.

1892. No cases of diphtheria, scarlet fever, or typhoid fever have occurred, but whooping cough and pneumonia were unusually prevalent.—Dr. A. M. Card, Sec.

1893. The action of the board this year has not been required on account of nuisances, and there has not been any prevalence of infectious diseases save whooping cough in school district No. 5. —A. B. Erskine, Sec.

Alton.

1892. I have neither nuisances nor cases of infectious diseases to report. There has been no work done only in the way of distributing circulars received from the State Board.

1893. We had two cases of typhoid fever and I notified the school teacher not to admit any of the family into the school.—H. L. McKechnie, Sec.

Amherst.

1892. Of infectious diseases we had one case of typhoid fever, and among the diseases of animals one case of tuberculosis occurred. —F. H. Silsby, Sec.

1893. There were seven cases of typhoid fever and measles was unusually prevalent.—S. S. Goodwin, Sec.

Andover.

No nuisances were reported to the board in either year. In 1892 one case of diphtheria occurred.—George O. Huse, Sec.

Anson.

1892. Three nuisances were reported to the board, two of which were abated and one improved. There were six or more cases of diphtheria and four of typhoid fever. The houses infected with diphtheria were placarded and all precautions were taken by the board. Measles was unusually prevalent. The school was closed for two weeks on account of cases of diphtheria, the house was fumigated and cleansed. Sewerage is very much needed in the village.—Dr. E. C. Andrews, H. O.

1893. Two cases of diphtheria, four of scarlet fever, and six of typhoid.—George F. Newell, Sec.

Appleton.

1892. We had twelve cases of scarlet fever which was the only disease unusually prevalent. The houses were quarantined and precautions were taken to keep the disease within bounds. Two schools were closed and one of the school-houses disinfected. A slaughter house in the village makes one particular locality unhealthy.

The experience of this board suggests the advisability of empowering the local board of health to close schools and forbid public gatherings of all kinds when contagious diseases are prevalent.

1893. Of two nuisances reported to the board one was abated. The typhoid fever appeared in one house. Answering your question as to the methods of improving the sanitary condition of our town I would suggest a diffusion of useful knowledge.—Levi W. Butler, Sec.

Argyle.

1892. One case of typhoid fever. Measles was quite prevalent. 1893. Two cases of typhoid fever. Pneumonia was prevalent. One death from blood poisoning as the result of a cut.—J. M. Freeze, Sec.

Arrowsic.

In neither year have we had cases of infectious diseases called for on the blank. Pneumonia and la grippe were plentiful in 1892. —C. C. Shea, Sec.

Ashland.

1892. In the fall we had an outbreak of typhoid fever in which twenty-seven cases occurred. Other diseases were not unusually prevalent. The cases of typhoid fever appeared to be caused by impure well water.—J. H. Carter, Sec.

1893. Improvements have been made in water-closets and in the disposal of excreta. Two nuisances were removed. There were three cases of typhoid fever. The sanitary condition of Ashland would be greatly improved by the introduction of a new system of water works.—Dr. H. L. Dobson, H. O.

Athens.

1892. No nuisances were reported to the board, but we had fourteen cases of scarlet fever and one of typhoid. When cases of contagious diseases appeared the houses were placarded and the inmates were requested to remain at home, which request has been obeyed. A public water supply is needed. One case of typhoid fever appeared to be due to drinking water from a well near a barnyard.—F. V. Barker, Sec.

Auburn.

1892. Nine nuisances reported to the board were removed. We had twenty-six cases of diphtheria, twenty-two of scarlet fever and twenty-nine of typhoid. German measles has been prevalent greatly confusing the differential diagnoses of the physicians.

In one house where three fatal cases of diphtheria occurred within a week from the first attack, the premises had no drainage, were in a visibly filthy condition, and they stood with the house the lowest, the stable higher, and the privy just beyond the stable, higher still. The contents of the privy oozed out from under the stable sill into its basement and was of course towards the house.

Methods of improving the sanitary condition of the city would be better sewerage and a garbage cart to remove decaying matter from boarding houses, hotels, etc, during hot weather.—Dr. J. W. Beede, Sec.

1893. The board has held a meeting every Friday morning during the year. Our sewerage system has been improved very much. Seventeen nuisances reported were all removed, in which work we have had no opposition from any source, and have had the hearty co-operation of the city government.

Fifteen cases of diphtheria, twenty-five of scarlet fever, and six of typhoid fever. Infected houses have been placarded immediately. In two instances the schools were closed and there was no spread of the disease from them. All contagious diseases have been cared for, and we know of no instance where infection has been carried outside of the house in which the disease was. Many private residences have been induced to enter the sewers.—Dr. A. M. Peables, H. O.

Augusta.

1892. A considerable improvement has been made in the sewerage system. There were reported to the board six cases of diphtheria and nineteen of typhoid fever. As health officer I have used every precaution to prevent the spread of contagious diseases. There has been no epidemic in town during the past year. Measles was more prevalent than usual.—Dr. F. C. Perkins, H. O.

1893. No severe epidemics and no contagious diseases occurred during the year. Thirty-two cases of typhoid fever, fourteen of scarlet fever, and thirty-five of diphtheria were reported to the

health officer. Every necessary precaution was taken to prevent the spread of contagious diseases. One school was closed and the school-house was disinfected on account of a small outbreak of diphtheria. Eighty-five children under ten years of age died. Thirty-one complaints of nuisances were received, all of which were promptly attended to by the health officer, no sanitary inspector having been appointed. About three-fourths of the nuisances were due to imperfect sewerage; many of the houses on streets where there are sewers do not connect with them.—Dr. H. J. Frederick, H. O.

Aurora.

Neither year were there cases of contagious diseases, but in 1892 lung fever among children was unusually prevalent, and in the following year there were many cases of diarrhœal diseases of children.—A. E. Mace, Sec.

Avon.

1893. No nuisances reported and no cases of infectious disease that have come under our observation.—George T. Jacobs, Sec.

Baileyville.

In 1892 there were no cases of infectious diseases, but in the following year four cases of typhoid fever came to the notice of the board, and one nuisance was abated. It was thought that one case of typhoid fever was caused by drinking impure water from a ditch.—John D. Lawler, Sec.

Baldwin.

In 1892 there were six cases of scarlet fever and three of typhoid fever. In November and December pneumonia was unusually prevalent.

1893. We had ten cases of scarlet fever this year and two of typhoid fever. Isolation and disinfection were attended to in connection with these cases.—Dr. Lorenzo Norton, Sec.

Bangor.

1892. There were 9,000 feet of sewers built this year. Of nuisances 180 were reported and all were removed or abated. Of the specified contagious diseases, were fourteen mild cases of diph-

theria, eight cases of scarlet fever all in a very mild form, and fifty cases of typhoid fever.

In connection with cases of contagious diseases, infected houses are placarded, the appropriate contagious disease circular is placed in the hands of the family, and the school agent is notified to have children from the infected houses kept from school. The public library is notified, and careful watch is kept of the case until recovery or death ensues. The infected houses are then disinfected and cleansed, and the children are readmitted to the school when the attending physician says that it will do.

1893. This year 500 feet of new sewers were laid, 100 nuisances were reported to the board, all of which were removed or improved. There were six cases of diphtheria, twenty-five of scarlet fever, and fifty-five of typhoid fever. In the diphtheria cases there was only one case in each house, and from the twenty-five scarlet fever cases twenty-one houses were infected. Every infectious house is placarded, and the same additional precautions are taken as were stated in last year's report.—John Goldthwait, Sec.

By-laws of the Local Board of Health of the City of Bangor.

Section 1. It shall be the duty of the secretary of the local board of health, of the city of Bangor, to carry out the orders of the board, see that the same are complied with and promptly notify said board of any violations of the law relating to health and the rules and orders of the board, also of any matter or thing that may come to his knowledge that may tend to endanger the health of the citizens of Bangor.

Section 2. In case of death from scarlet fever, diphtheria, smallpox, cholera or typhus fever, a public funeral is hereby forbidden and the burial shall take place without exposing people to the contagion more than is absolutely necessary, and the remains shall not be transported except as directed by the executive officer of the local board of health.

Section 3. All animals dying within the limits of the jurisdiction of the local board of health of the city of Bangor shall be promptly buried in such places and in such manner that they shall not endanger the health of the citizens of Bangor.

Section 4. All houses, outbuildings and premises within the jurisdiction of the local board of health of Bangor must, at all

times, be kept in a clean, healthy condition, and any and all matters and things and sources of filth that may tend to constitute a nuisance or a source of danger to the public health must be promptly removed and abated, otherwise the required notices will be given and the penalty provided by statute will be enforced.

Section 5. All accumulations of refuse matter such as swill, waste of meat, fish and shells, decayed vegetables and excrement of every kind which may decompose and generate disease germs or unhealthy gases, and become a source of danger to the public health, shall not be permitted to remain upon any premises within the jurisdiction of this board longer than a reasonable time to remove the same, not exceeding forty-eight hours. Otherwise the statute and city ordinance relating thereto will be enforced against the delinquent.

Section 6. Any and all persons engaged in clearing vaults within the jurisdiction of the local board of health of Bangor, shall use water-tight carts or wagons, and such carts or wagons shall not be used upon any streets except during the hours between ten P. M. and four A. M., and such carts or wagons shall not be permitted to stand upon any public street, square or lane, except while they are being loaded during the hours named.

Section 7. Swine of any kind shall not be kept within the limits of the thickly settled portions of the city of Bangor during the months of May, June, July, August, September and October, and the local board of health hereby reserves the right to order the removal of swine from any premises within the jurisdiction of this board during the months named, providing said board shall at any time adjudge that the continuance of said swine on the premises, wherever they may be found, will tend to endanger the public health; and in all cases where the local board of health hereafter adjudge that the keeping of swine upon any premises may tend to endanger the public health, the occupant shall remove such swine within forty-eight hours after written notice of such judgment, and a failure to comply with this rule shall make the delinquent liable to a penalty of $1.00 per day for each swine, for every day that they are kept in violation of this rule.

Section 8. On and after the first day of September, 1892, no person shall be allowed to construct any privy vault, cesspool or any other receptacle or conductor for drainage for filth of any kind

in any locality within the city limits where access can be had for drainage to a public sewer. When, upon proper complaint made in writing to the board of health, any privy vault, cesspool, receptacle or conductor constructed and maintained prior to the adoption of these orders shall after careful and thorough examination be adjudged by the board of health to constitute a nuisance or a source of danger to the public health, such privy vault, cesspool, receptacle or conductor shall forthwith be discontinued and abolished when the premises upon which said nuisance exists can be connected with the public sewer. Where such nuisances exist in localities unprovided with proper street sewers, such disposition shall be made of them as the board of health may determine.

Section 9. Cellar, sink and other drains from all premises located upon any street which has a public drain or sewer shall be entered into such public drain or sewer, otherwise all refuse from such sink and other drains shall be disposed of in a manner satisfactory to the local board of health, and the premises kept neat and free from all matter that can tend to endanger the public health.

Section 10. It shall be the duty of the secretary of the board of health to keep an exact account of all costs, outlays and expenses incurred in carrying into effect any of the purposes and provisions of these by-laws, and without delay to report the same to the city auditor of accounts, and the names of the various persons to whom they may be chargeable, and the proportion or amount payable from such persons, to the end that the city auditor may examine, correct and charge the same in his books, and deliver correct bills therefor to the city treasurer for collection.

Section 11. The local board of health of Bangor or the secretary thereof, may employ and hire such help as is necessary for carrying into effect any of the orders or regulations of said local board of health of Bangor.

Baring.

1892. Of the specified infectious diseases we had only eight cases of scarlet fever. Disinfection and other precautions to prevent its spreading were taken.

1893. As regards nuisances we have investigated thoroughly and have found none. We have received no reports of contagious diseases.—Joseph Stevens, Sec.

Bath.

1892 & 1893. The city has been uniformly free from epidemics. The prevailing diseases have been those usually prevalent every year. Typhoid fever, which was formerly very common, has now nearly disappeared. A smaller number of children died during the summer months of zymotic diseases than has been recorded for several years. A mild epidemic, confined to adults, of winter cholera prevailed during the latter part of January, 1892, and the first of February, 1893. It was believed to be due to atmospheric influences. A few cases were severe, but no deaths were recorded.

A good quality of ice has been supplied to the citizens from Nequasset Pond, Sewall's Pond and Goddard's Pond. A good supply of pure water has been furnished until the latter part of January, 1893, when for nearly two weeks the supply was short, owing to a break in the pipes at New Meadows river. Should such a thing occur in the hot summer months the health of the city could not help being affected very considerably.

After the introduction of Thompson's brook water, people discarded their cisterns and their wells, and these from disuse became unfit for use; so that, when the public water supply was shut off, there was a greater dearth of water than was ever known in the city. The charitable manner in which the citizens conducted themselves during their deprivation of this very essential commodity, must be a great source of gratification to the water company, and speaks well for the forbearing good sense of our towns-people.

It should be the duty of the city to insist that every precaution shall be taken, so that such accidents may be avoided in the future.

Several grave nuisances have been reported and abated. Several short streets have been drained, thereby improving the sanitary condition of the localities so drained. The sanitary condition of the valley in the rear of Wesley church was very bad and dangerous to health during the summer of 1892. A drain should be run there in the early spring. No worse practice could be tolerated than that of allowing private drains, connected with water closets and sink spouts, to terminate under the public sidewalks, as is known to exist in various parts of the city. It is the opinion of the board that the street commissioner should have positive instruc-

tions from the city government concerning this practice. The board of health can deal with such cases only as public nuisances arise. It is provided for by city ordinance in nearly every city of considerale size in the country.

The swill pail nuisance is still in vogue, in several milk carts, most of the year round. An ordinance should be framed covering such nuisances. The swill pail in proximity to public milk supply is not only barbarous, but capable of disseminating zymotic diseases through a city by the wholesale. I would recommend that a milk inspector be appointed to inspect the milk supply from time to time. The duties could be performed by the board of health if they were given the authority.

I desire to call your special attention to the very large number of scholars in the city schools who have never been vaccinated. In a canvass of thirty-five schools visited March 7 and 8, 1893, there were in attendance 1349 scholars. Of that number there were 770 scholars who had never been vaccinated. Some steps should be taken towards the general vaccination of all scholars who have never been vaccinated, before the beginning of the fall term of 1893.—Dr. E. M. Fuller, Sec.

Beddington.

1892. We had eighteen cases of scarlet fever all of which recovered. There was one case of cerebro-spinal meningitis. One school was closed on account of scarlet fever and the school-house was disinfected.

1893. As regards nuisances we have been troubled by the spreading of tannery fleshings beside the highway for one-third of a mile, which is very offensive to the public who have occasion to travel on the road. Four cases of scarlet fever, one of which proved fatal. Whooping cough prevailed.—Charles B. Farnsworth, Sec.

Belfast.

1892. No sewers were laid during the year. Six complaints of nuisances all of which were removed. We have had six cases of scarlet fever and two of typhoid fever. The continuance of the system of sewerage which has been started would improve the health condition of the town.

1893. This year $4000 were expended on the sewers. No diseases were unusually prevalent except measles.—B. H. Conant, Sec.

Belmont.

There was one case of typhoid fever in 1892. Other diseases were not reported.—Miles Pease, Sec.

Benedicta.

Both years are reported as remarkably free from the prevalence of diseases. There were two cases of scarlet fever in 1892 and one of typhoid fever the next year.—Thomas F. Ryan, Sec.

Benton.

1892. Two cases of scarlet fever and two of typhoid. One of the cases of typhoid fever was contracted out of town. La grippe prevailed in a mild form.—Bryant Roundy, Chairman.

1893. Four nuisances reported to the board were removed. Nineteen cases of scarlet fever resulted in two deaths. Houses were placarded and the inmates were isolated.—A. L. Plummer, Sec.

Berwick.

1892. Seven nuisances have come to the knowledge of the local board during the year, all of which were promptly removed. We have had two cases of typhoid fever, with one death; and three cases of scarlet fever all of which recovered. Also seventeen cases of diphtheria have occurred, with six deaths.

The number of cases of this last disease, as well as its mortality, is increased by the stubbornness with which some persons reject thorough disinfection and isolation. One man who lived back in the country did not want me to see his sick child or even to enter his house. I tacked up a card which he thought was not necessary, and gave him a few instructions and circulars No's. 44 and 47. He did not want any assistance from the board of health and said he should cleanse his house thoroughly himself. The result was that four cases of diphtheria occurred there at intervals of two or three weeks. The doctor, who treated them all, was not called to see the last till just before it died. He reported to me the next day and I interviewed the other members of the board, and con-

jointly we gave the man directions as to what he must do. He wanted me to fumigate for him, saying that he had done so thoroughly after each of the previous cases, and also stating that the doctor and undertaker both said that he did much more than was necessary. Three of his family had died of diphtheria within a space of four months. I did what I thought was a thorough job for him, and he has not had any diphtheria or deaths in his family since.

Besides the above there has been but little sickness in town during the year since la grippe left us last spring. We have recently had two cases of pneumonia. During the above infectious diseases quite thorough isolation and disinfection were secured in most cases.

1893. Ten nuisances reported to the board were removed. We had four cases of diphtheria and the same number of typhoid fever. Infected houses have been placarded and isolation and disinfection have been required in accordance with the health laws of the State. One school-house was thoroughly fumigated, as it was thought prudent lest diphtheria might be lurking about the building. As some of the wells are quite bad, a better water supply would improve the health condition.—Dr. P. B. Young, Sec.

Bethel.

1892. Two nuisances were removed by the board, all that were reported. Scarlet fever in a very mild type prevailed quite extensively. There were fifty cases, but no deaths from this cause. Six cases of typhoid fever also occurred. Measles and German measles have prevailed to some extent.—Dr. C. D. Hill, H. O.

1893. One nuisance was reported to the board and removed. A system of drainage has been laid. Scarlet fever this year has prevailed in a mild form, so that from twenty-five cases no deaths occurred. We had three cases of typhoid fever. The usual precautions are promptly taken to prevent the spreading of infectious diseases.—A. W. Grover, Sec.

Bingham.

1893. There has been an increased use of water from two aqueducts which now supply most of the families in the village. Of three nuisances reported to the board all were abated. A strict quarantine was enforced in two cases of scarlet fever. Otherwise

than these no cases of infectious diseases have occurred. It would be better for the farming community if they were more fully enlightened as to the sanitary laws.—T. F. Houghton, Sec.

Blaine.

In 1892 we had one case of typhoid fever and in this last year four. This year two nuisances were removed, one of which, a slaughter-house, was abated after the prosecution of the owner.—John M. Ramsey, Sec.

Blanchard.

Of the specified infectious diseases there were no cases in either year. The only nuisance reported to the board was abated. German measles prevailed in 1892.—E. P. Blanchard, Sec.

Bluehill.

1892. Fourteen cases of scarlet fever and twelve of typhoid fever occurred. When we have cases of infectious diseases prompt action is taken, such as is required by law, to prevent their spreading. Other diseases were not unusually prevalent. Sanitary improvements could be made by better drainage and better ventilation both in public and private houses.

1893. This year scarlet fever has prevailed. There were thirty cases, but no deaths from that cause. We had seven cases of typhoid fever. Scarlet fever broke out in two of the schools. The schools were promptly closed and the rooms thoroughly disinfected before the schools were re-opened.—Dr. R. P. Grindle, H. O.

Boothbay.

1892. Of the specified contagious diseases we had nothing but six cases of typhoid fever, one of which ended fatally. There were the fewest cases of diarrhœal diseases for fifty years. There were two cases of glanders in horses, both of which were killed.

1893. Only one nuisance was reported to the board and this was removed. Of infectious diseases we had four cases of typhoid fever. Measles and whooping cough prevailed.—Dr. Alden Blossom, H. O.

Boothbay Harbor.

1893. The four nuisances reported to the board were removed. Eight cases of typhoid fever were all we had of infectious diseases

save measles and whooping cough. In cases of measles or whooping cough the scholars were kept from attending school.

In the preceding year, 1892, we were free from infectious diseases save two cases of typhoid fever.—Dr. Alden Blossom, H. O.

Bowdoin.

1892. One nuisance was all the board was called upon to remove. Three cases of diphtheria occurred in one house. No other diseases have been especially prevalent.

1893. This year we had eight cases of scarlet fever and two of typhoid. The cases of scarlet fever were very mild.—Thomas R. Rand, Sec.

Bowdoinham.

1893. The local board obliged the railroad to put in a culvert which was much needed. One nuisance was abated. We had two cases of diphtheria and three of typhoid fever. The usual precautions were taken against the spreading of these diseases. Better drinking water and a better condition of the privies would be a sanitary improvement. Two cases of typhoid fever were thought to have been caused by drinking well water which was believed to be impure.—Dr. I. C. Irish, H. O.

Bowerbank Plantation.

1893. We have had no cases of contagious diseases.—Edward Clarke, Chr.

Bradford.

1892. No disease has been unusually prevalent save scarlet fever of which there were eleven cases. We had four cases of typhoid. Prompt quarantine has been established and enforced.

1893. One nuisance was reported and abated. We had only one case of diphtheria and two of typhoid fever. Measles, whooping cough and influenza were unusually prevalent. Improved sink drainage and the placing of wells more remote from buildings would undoubtedly improve the healthfulness of some places. Some of the horses in this town seem to suffer with influenza.—Dr. D. C. Dennett, Sec.

Bradley.

1892. Four cases of scarlet fever and three of typhoid fever were reported. Precautionary measures were taken by the board. Several dead animals which were producing nuisances were disposed of.—William Perkins, Sec.

1893. One nuisance was abated. Scarlet fever, eleven cases; typhoid fever, three cases. Houses were quarantined and the inmates were requested to be careful not to spread the infection. Infectious children were taken from school.—John N. Knapp, Sec.

Bremen.

In 1892 there were three cases of diphtheria and one of typhoid fever; and in 1893, only one case of typhoid fever was reported. —1892, Wm. B. Hilton, Sec.; 1893, H. A. Heath, Sec.

Bridgewater.

1892. No contagious diseases were reported this year. Two nuisances were abated.

1893. We had twelve cases of scarlet fever and eight of typhoid fever. Measles broke out in the schools. We closed the schools for a time. Several cases of typhoid fever in a boarding house were supposed to be due to impure water, as the well received the drainage of the whole premises.—R. H. Perkins, Sec.

Bridgton.

1892. No cases of infectious diseases have come to the notice of the board save two of typhoid fever contracted at Brunswick, Maine.

1893. There were one case of diphtheria, four of typhoid fever, and two of measles, all of which were taken care of, but none of which gave serious trouble.—Isaiah S. Webb, Sec.

Brighton.

For the two years no cases of infectious diseases are reported with the exception of measles in 1893.—Charles A. Hayden, Sec.

Brooklin.

1892. One nuisance reported to the board was removed. One case of typhoid fever. The only disease generally prevalent was la grippe in the first part of the year. In some sections of the town nearly every one had it, in some cases six or seven in one family were sick at once. Out of about 200 cases of this disease no deaths resulted directly from it, which we think was very remarkable.

I desire to say that the copies of your reports sent last year were duly and thankfully received, and faithfully distributed among our people, by whom they are highly appreciated. A larger number would be gladly received and read.

1893. There were four cases of scarlet fever. Infected houses have immediately been placarded and isolated and all other needed precautions taken, so that from neither of the two infected houses did the disease spread to any other. We think that in the two outbreaks of scarlet fever we were very fortunate in confining each outbreak to the house in which it occurred. It proves such diseases can be kept from spreading.—E. P. Cole, Sec.

Brooksville.

1893. Scarlet fever was unusually prevalent and, in spite of their being faithfully attended to, the number of cases amounted to thirteen. We had six cases of typhoid fever. Scarlet fever was brought from out of town to one family, and the cases of typhoid fever were contracted outside of this town.—Jerry Jones, Sec.

Brookton.

1892. No cases of infectious diseases were reported. One nuisance, a school privy that had not been cleaned for four years, was abated by the board.—George A. McCluskey, Sec.

Brownfield.

1892. We had this year seven cases of scarlet fever and one of typhoid fever, in connection with which disinfection and isolation were provided for. Whooping cough prevailed to some extent.

1893. No nuisances were reported to the board, but we had six cases of scarlet fever and four of typhoid fever, with some cases

of whooping cough. Polluted well water appeared to be the cause of the typhoid fever.—Dr. H. F. Fitch, Sec.

Brownville.

1892. Some improvements have been made in the direction of drainage. Of twelve nuisances reported to the board all were taken care of excepting one. Six cases of diphtheria and four of typhoid fever. When we have had cases of infectious diseases we have isolated the affected family and ordered the neighbors to keep away so there has not been any spread of the disease. We had forty or fifty cases of measles in a very mild form.

Changes to be recommended in this town are different arrangements of the privy vaults, better drainage and the complete removal of a slaughter-house from the village.

1893. We are making some improvements in the direction of water supply. Six nuisances were abated. That old slaughter-house still gives trouble. No infectious diseases were reported. Two horses affected with glanders were killed.—S. W. Pratt, Sec.

Brunswick.

1892. About the usual number of nuisances have been reported, and removed by the board. Infectious diseases have been represented by three cases of diphtheria, ten of scarlet fever and eight of typhoid fever. The cases of scarlet fever were in a small settlement on the outskirts, and the outbreak was easily isolated from the rest of the town. The neglect of the first case by the parents caused the infection of the whole neighborhood. An extension of our sewerage is needed.—W. O. Peterson, Chr.

Buckfield.

1892. No diseases have been unusually prevalent unless we may except scarlet fever of which there were six cases. There was one of diphtheria. The sanitary condition of the town is excellent.—Dr. J. F. DeCoster, Sec.

Bucksport.

1892. Several nuisances reported to the board were removed. Diphtheria, four cases; scarlet fever, three; typhoid fever, four. Infected houses are placarded immediately and isolated, and subse-

quently the houses are properly cleansed. One school-house was placarded and then disinfected. Better sewerage is wanted.

1893. Of ten nuisances all were removed. We had five cases of scarlet fever and four of typhoid fever. We still need better sewerage.—E. A. Crocker, Sec.

Burlington.

In the two years we have had no cases of the specified infectious diseases, but each year several nuisances were abated by the board. —1892, J. W. Bradbury, Sec.; 1893, Thos. Shorey, Sec.

Burnham.

1893. Two nuisances have been reported to the board, one of which has been removed. We have had one case of diphtheria, one of scarlet fever and two of typhoid, all of which were looked after promptly. More than anything else we need the influence of public opinion for the improving of the sanitary condition of the town.—George Dyer, Sec.

Buxton.

1892. Four nuisances were removed. Diphtheria was unusually prevalent, twenty-two cases resulting. We had three cases of typhoid fever, and la grippe and whooping cough were present. In most of our country schools the ventilation is very imperfect.

Answering your question as to whether the experience of our board suggests any changes which ought to be made in the health laws of the State, I would say that I think there should be State legislation to restrict the spread of tuberculosis in human beings as well as in animals.

1893. Five nuisances were reported. Measles, whooping cough, mumps and chicken-pox, among the milder diseases, have prevailed; and of scarlet fever we had twenty-eight cases with one death from that cause.

In places along the river banks where rubbish and offal have been deposited we have stopped the practice and put up signs reading: "Deposit no Offal or Rubbish Here. Per order B. of H." —Dr. Charles A. Dennett, H. O.

Byron.

1892. We have had neither nuisances to deal with nor cases of contagious diseases.

1893. This year two cases of scarlet fever and one of typhoid, in connection with which action has been taken at once as the law requires and in accordance with the instructions of the State Board of Health.

Scarlet fever was brought here from Rumford Falls in some books and papers which a child had had while convalescing from this disease. One little girl came down with it in two days, while the other did not until the end of four days, and another child in the same house did not have it at all.—H. H. Richards, Sec.

Calais.

1892. Twenty nuisances have been abated, thirteen of which were reported to the board. Of diphtheria there were forty-three cases, of scarlet fever, twenty-seven, and of typhoid fever, four; in connection with these cases isolation was provided, and thorough ablutions and disinfection. One school was closed until put in a sanitary condition. Continued improvement in our sewerage is needed. A few cases of glanders in horses each of which was killed or died from the disease.

1893. Improvements have been made in the methods of disposal of excreta. Ten nuisances were abated, seven of which were reported to the board. We had sixteen cases of diphtheria and six of scarlet fever which were treated with the usual sanitary precautions.

A few cases of drowning have occurred. There were two deaths from fire in a burning building, and one child was burned in the absence of its parents by its clothes catching fire.—Dr. D. E. Seymour, Sec.

Cambridge.

Two nuisances were abated in 1893. Infectious diseases are reported in neither of the two years.—S. G. Quimby, Sec.

Camden.

1892. We have the best water supply in the State. The source is Mirror lake. We expect to have drainage and sewerage this year. Of eleven nuisances reported all were removed. There were twenty-eight cases of scarlet fever and two of typhoid, none of which proved fatal. In every case we have placarded the house and left circulars and at the proper time disinfected all the rooms.

The school-houses were also disinfected. There have been a few cases of measles in a light form.

1893. This year we have sewerage, and our board recommends more in the near future. One case of diphtheria, seven of scarlet fever and one of typhoid fever were managed with the usual precautions as recommended by the State Board. By the upsetting of a boat one young man was drowned.—A. Buchanan, Sec.

Canaan.

1892. No infectious diseases, but pneumonia and diarrhœal diseases of children were quite prevalent.—Dr. L. W. Shean, Sec.

1893. No contagious diseases reported.—Jas. Harmon, Sec.

Canton.

1893. No cases of infectious diseases were present. Whitney brook runs through the centre of our village. At the upper end there is a tannery which empties its filth into it, giving it an unhealthy look, to put it mildly.—R. A. Barrows, Sec.

Cape Elizabeth.

1892. During the year a full system of water works has been introduced. The supply is from Sebago lake. Complaints of two nuisances were made to the board, both of which were removed. There were one case of diphtheria, twenty-five of scarlet fever and two of typhoid fever. Houses have been placarded and precautions taken against the spread of disease by visiting or otherwise. —Thomas B. Haskell, Sec.

Caribou.

1892. Nine nuisances reported to the board were removed. We had five cases of scarlet fever and twenty of typhoid. With the exception of typhoid fever and scarlet fever no diseases were unusually prevalent. Sewers of a better kind are needed. Polluted water appeared to be the cause of the cases of typhoid fever.

1893. Six nuisances removed. Twenty-three cases of scarlet fever and five of typhoid fever. The need of the village is still in the direction of sewerage.—Dr. J. Cary, Sec.

Carmel.

1892. One nuisance was removed. Four cases of scarlet fever and one of typhoid. Houses are placarded and the inmates of infectious houses are isolated.—F. A. Simpson, Sec.

1893. One nuisance was removed. No case of infectious disease in man, but there have lately been three cases of tuberculosis in cattle.—Henry Kimball, Chr.

Carratunk Plantation.

1893. We had no contagious diseases save German measles.—W. D. Moore, Sec.

Carroll.

1893. Infectious diseases have not been present.—E. W. Thibodeaux.

Carthage.

No cases of infectious diseases in 1892; in 1893 two cases of typhoid fever. Measles was prevalent in the spring of 1893. Precautions are taken against the spread of infectious diseases.—S. C. Morse, Sec.

Casco.

1892. One nuisance was removed. No cases of diphtheria or scarlet fever and only one of typhoid fever.

1893. No complaints of nuisances this year, and of infectious diseases only one of typhoid and one of measles. Russian influenza is now prevailing to an alarming extent. There was one case of cancer in a horse. The animal was killed.—Dr. Charles H. Young, Sec.

Castine.

1892. Four nuisances reported to the board were all removed. Twenty-eight cases of scarlet fever and two of typhoid fever came to the notice of the board. Houses were immediately visited by the secretary, and strict orders given in each case. Whooping cough prevailed. During the absence from town of all the members of the board scarlet fever broke out in one school-house.

Quarantine regulations, practically the same as those of the Portland board of health, were adopted by this board, in view of

the impending possibility of the introduction of cholera.—Dr. George A. Wheeler, Sec.

1893. The State Normal School in this town has been supplied with a sewer running from the school building to the river, and a number of private residences on the line have connected with the sewer. Three nuisances, reported to the board, were removed. We had no cases of diphtheria or typhoid fever, but there were fourteen cases of scarlet fever, and whooping cough was present.

When scarlet fever had reached five or six cases we deemed it advisable to close the schools and churches. This we think should be done in all cases where contagious diseases assume an epidemic character.—Dr. S. J. Wallace, H. O.

Castle Hill Plantation.

1893. Save the prevalence of whooping cough and two cases of typhoid fever, there have been no cases of infectious diseases. Sanitary precautions were taken with the two cases of typhoid fever. The cases of typhoid fever were caused by polluted water. —Dr. Charles E. Dow, H. O.

Caswell Plantation.

1893. Two earth privies have been built for the school buildings. The only nuisances of which we have reason to complain is the polluting of the stream, from which people get their drinking water, by cattle, and the leaving of dead animals on the surface of the ground. There has not been a case of infectious disease.—L. F. Potter, Sec.

Centerville.

With the exception of whooping cough in 1893 there were no catching diseases within the two years. One nuisance was abated this year.—Willis C. Caler, Sec.

Chapman Plantation.

1893. We have had no cases of infectious diseases save a few cases of measles now.—Edward C. Cook, Sec.

Charleston.

1892. We have had one case of scarlet fever and five of typhoid fever. Vaccination has been sadly neglected in this town; scarcely any under the age of ten years have been vaccinated.

1893. The only cases of infectious disease have been two of typhoid fever, and these two came home from another town with the disease.—Dr. G. B. Noyes, H. O.

Charlotte.

1892. Our town has for some years been free from contagious diseases.—F. J. Sprague, Sec.

Chelsea.

1893. We have had two cases of typhoid fever. There have been no improvements as regards water supply, drainage and sewers, but a worse condition caused by the new sewer at the National Home.—A. N. Douglass, Sec.

Cherryfield.

1893. Seven cases of diphtheria and one of typhoid fever occurred, which were investigated and isolated as far as was necessary. In one district malignant cases of diphtheria have occurred occasionally for twenty or twenty-five years. The disease was suspected to have its origin in an old school-house, accordingly the use of the house for school purposes was forbidden. There have been no cases since.—Dr. E. B. Silsby, Sec.

Chester.

During the two years there have been no cases of infectious diseases. Our town is situated on high land and is generally very healthy.—J. D. Kyle, Sec.

Chesterville.

1893. Two nuisances were removed. No infectious diseases are reported.—Simon T. Grant, Sec.

China.

1892. Two nuisances were removed. There were three cases of diphtheria, one of scarlet fever and one of typhoid fever. When a case of infectious disease appears, the health officer immediately visits the case, placards the house and the board assumes full control of the case until this quarantine is removed.

You will note that I reported but one case of scarlet fever. I am satisfied that another case occurred which was not reported to our board. A woman from a neighboring town visited this family while the child was desquamating, and consequently carried the disease to her own family in which a severe outbreak occurred.

1893. Four nuisances reported were all removed. There have been two cases of scarlet fever and one of typhoid fever. Horses and cats have been sick with an epidemic disease, probably la grippe.—Dr. G. J. Nelson, H. O.

Clifton.

1892. No cases of infectious disease reported.—S. A. Parks, Sec.

1893. No contagious disease with the exception of measles.—W. D. Campbell, Sec.

Clinton.

1892. One nuisance was abated. We have had occasional cases of measles, two cases of typhoid fever and four cases of diphtheria. One horse was killed on account of glanders.—Dr. Elmer E. Brown, H. O.

1893. Two nuisances were abated, and improvements in the way of draining a brook have been made. No cases of contagious diseases have come to the notice of the board save one of typhoid fever.—John W. Waldron, Sec.

Codyville Plantation.

1893. We have not been troubled with contagious diseases.—Thomas O. Hill, Sec.

Columbia.

1892. We have had no cases of infectious diseases with the exception of eight very mild cases of scarlet fever.

1893. This year no diseases have been unusually prevalent, and we have had no cases of contagious diseases except twenty-seven cases of scarlet fever.—John E. Stewart, Sec.

Columbia Falls.

1892. We had an epidemic of scarlet fever, about twenty cases, and three cases of typhoid fever. Measles prevailed.—H. M. Leighton, Sec.

1893. This year we have had three cases of typhoid fever.—Dr. E. A. White, Sec.

Concord.

1892. One case of typhoid fever, in connection with which directions were given as to disinfection. There were about thirty cases of measles in the spring. The wide spread of measles was caused by an auction at Bingham where a clerk in the sales room was just coming down with the disease.

1893. One nuisance was abated. The action of the board has not been required on account of infectious diseases.—Edwin O. Vittum, Sec.

Connor Plantation.

1893. Contagious diseases have been absent.—Nelson Lessard, Sec.

Cooper.

There were no cases of infectious diseases in either year, with the exception of measles in 1893, on account of which one school was stopped two weeks.—1892, W. W. Sadler, Sec.; 1893, Willis G. Day, Sec.

Corinna.

1892. Two nuisances abated. Four cases of typhoid fever. We have carefully looked after each case. There were some cases of whooping cough.

1893. This year no complaints of nuisances and no cases of infectious diseases.—J. P. Curtis, Sec.

Cornish.

1892. Of about twelve nuisances reported nearly all were abated. A slaughter house has given much trouble. One case of diphtheria and we have had quite an epidemic of scarlet fever.—Dr. W. B. Swasey, H. O.

1893. This year there have been twenty cases of scarlet fever and one of typhoid. Scarlet fever prevailed in a very mild form.—Howard Brackett, Sec.

Cornville.

1892. We had no cases of infectious diseases and but one complaint of nuisance this year.

1893. There was one case of diphtheria which was looked after with care.—S. S. Woodman, Sec.

Cranberry Isles.

1892. Some sanitary improvements have been made. A sewer leading from the hotel to the seashore, a distance of 1,400 feet, has been put in, and also water has been brought from a boiling spring some 400 feet away, and some of the dwelling houses have been supplied with local drainage.

There were no cases of infectious diseases in 1893. One nuisance was reported and removed. One mild case of typhoid fever. —William P. Preble, Sec.

Crawford.

1892. There has been no sickness in town of any account during the year.—Robert Wallace, Sec.

Cumberland.

1892. Twelve cases of diphtheria, three of scarlet fever and six of typhoid fever occurred. Immediate attention was given to the cases as far as possible. Schools were closed and thorough disinfection of everything pertaining to them was made.—Dr. C. T. Moulton, H. O.

1893. One nuisance removed. One case of diphtheria, eleven of scarlet fever and five of typhoid fever.—Dr. H. M. Moulton, H. O.

Cushing.

1892. No infectious diseases present. 1893. No infectious diseases excepting one case of typhoid fever in connection with which all necessary precautions were taken.—A. R. Rivers, Sec.

Cutler.

No cases of diphtheria, scarlet fever or typhoid fever within the two years. Mumps were prevalent in the fall of 1892 and the board was called to attend to one nuisance the following year.—George Gardner, Sec.

Dallas Plantation.

1893. Two nuisances came to the notice of the board. Otherwise than one case of scarlet fever, no infectious diseases.—Mrs. Ella G. Adams, Sec.

Damariscotta.

1892. Two nuisances abated. No contagious diseases save measles and whooping cough. Cleanliness in the way of better arranged and managed privies and sinkspouts would improve the sanitary condition of the town, and the village needs a water supply.

Laws providing for the appropriation of say five cents per capita for sanitary purposes would be a good thing.

1893. One nuisance was abated. A reservoir has been built in the flats near the wharf to provide water for fire purposes. There is a want of street drainage, and the business portion of the village gives trouble on account of uncleanliness. The too common practice of slaughtering small animals on the premises of the meat markets has been prohibited this year, and the principal business street has been kept more cleanly than hithertofore. We have now a village improvement society.

We have had no cases of infectious diseases save measles, which was spread carelessly by a young man who had the disease. By prompt action in excluding pupils presumably affected, it was not found necessary to close the school in district No. 1, though many of the pupils took the infection from outside and dropped out.—A. H. Snow, Sec.

Danforth.

1892. Eighteen nuisances reported to the board were removed. Nine cases of typhoid fever. Better drainage and better water supply are needed.

1893. Seven nuisances removed. This has been a very healthful year; there were no cases of contagious diseases. Better drainage is still the need.—Dr. M. L. Porter, Sec.

Dayton.

1892. One nuisance removed, but no infectious diseases have been present.

1893. One nuisance removed, all that has appeared. We have been unusually free from contagious diseases or epidemics save influenza. We have no unhealthful localities except a mill pond, which, sometimes, nearly dries up.—Dr. George Sylvester, H. O.

Dead River Plantation.

1893. Neither infectious diseases nor nuisances have made it necessary for the board to take action. We live under the shadow of old Mount Bigelow, called the most healthful place on the continent.—S. A. Parsons, Sec.

Deblois.

1892. There were three or four cases of scarlet fever. There is no local board of health.—Daniel F. Libby.

Dedham.

1892. No cases of infectious diseases save one of typhoid fever.—W. B. Black, Sec.

1893. Four cases of scarlet fever and one of typhoid. The cases of scarlet fever were confined to one family. The house was isolated and a person was appointed to attend them. Disinfection was cared for by the attending physician.—J. E. Turner, Sec.

Deering.

1892. Eleven nuisances reported to the board were all promptly abated with the exception of two. In these two cases the persons at default were brought before the city justice and found guilty. They were discharged by paying the costs of court, and promising to remove the nuisances to the satisfaction of the board of health within thirty days. Term not yet expired.

In the way of infectious diseases we had three cases of small-pox, four of diphtheria, twenty-four of scarlet fever and thirteen of typhoid fever. Infectious cases have at once been attended to by placarding and quarantining the houses, and other measures taken to keep the disease from spreading. We need a continuation of the sewer system.

1893. Sewers have been quite extensively built in our city this year and work is still in progress. Twenty-nine nuisances reported were all removed. Three cases of small-pox, twenty-seven of scarlet fever and five of typhoid. Whooping cough has been present.

A law to compel citizens to enter the sewer when it passes their doors would be a great improvement in the health laws.—George Russell, Sec.

Deer Isle.

1892. Two nuisances abated. Two cases of scarlet fever and twenty of typhoid. Better drainage and a better water supply at Greene's Landing would work a sanitary improvement. Four deaths by drowning.

1893. Two nuisances removed. Scarlet fever in a very light form was very prevalent. Fifty-five cases occurred, with one death. There were ten cases of typhoid fever. Six deaths by drowning.—Andrew J. Beck, Sec.

Denmark.

In 1892 the board was called upon to take action only in one case of nuisance.—J. W. Colby, Sec.

In 1893 two nuisances were removed, and we had two cases of typhoid fever. One glandered horse was killed.—Dr. S. T. Brown, H. O.

Dennistown Plantation.

1893. Dennistown Plantation is a small community and there has been neither sickness nor accident among the inhabitants during the year.—J. H. Wilson, Sec.

Dennysville.

1892. Two cases of scarlet fever occurred, which were cared for according to law.—E. P. Foster, Sec.

1893. This year four cases of scarlet fever and no other cases of infectious diseases save measles and whooping cough.—Fred L. Gardner, Sec.

Detroit.

In 1892 one case of typhoid fever, not reported to the board. It was supposed to have been caused by polluted water.

No cases of infectious diseases in 1893 save one case of German measles in a child who was excluded from school on that account. David F. Libbey, Sec.

Dexter.

1892. Four nuisances reported to the board were all removed. One case of scarlet fever and five of typhoid fever appeared. Measles and whooping cough were present.

1893. Some sewerage was laid during the year. Eight nuisances reported to the board were removed. We had no cases of infectious diseases except five of scarlet fever. All such cases are reported to the board at once. The houses are then immediately placarded and precautions taken.—Edgar A. Russ, Sec.

Dixfield.

1892. Two nuisances removed, and two cases of typhoid fever. Measles prevailed in this and the adjoining towns. Two deaths in a neighboring town from measles and its sequels.—Dr. G. G. Richardson.

1893. There has been a general prevalence of measles, but otherwise, save six cases of typhoid fever, we have been free from infectious diseases. Three of the cases of typhoid fever were imported. The six cases were in six different households and by keeping the dishes used by the patients by themselves, and scalding them, by allowing no person to eat or drink in the room or to use anything that had been in the sick room, and by disinfecting carefully all soiled clothing and excreta, no second case occurred in any of the houses.—Dr. J. S. Sturtevant, Sec.

Dixmont.

1892. Two nuisances removed. Tonsilitis was quite prevalent and infected children were kept out of school for awhile. Otherwise we have had no infectious diseases. Several persons were taken violently ill after eating from a piece of cheese. The cheese was examined, but the cause of the poisoning was not ascertained.—W. H. Toothaker, Sec.

Dover.

1892. Four nuisances were removed. We have had one case of scarlet fever, one of diphtheria and three of typhoid fever. Due precautions were taken against the spread of infection. A complete new system of sewerage is needed.

1893. Two nuisances were removed, all that were reported to the board. Three cases of diphtheria and one of typhoid fever appeared. Their management was in strict conformity with the requirements of the law. Measles was very prevalent, but no deaths occurred.—George G. Downing, Sec.

Dresden.

1892. We had one case of scarlet fever and two of typhoid fever. In 1893 there were no cases of diphtheria or scarlet fever, but we had two of typhoid fever.—Dr. L. H. Dorr, H. O.

Drew Plantation.

1893. No cases of infectious diseases reported.—Charles R. Andrews, Sec.

Durham.

1892. Three cases of diphtheria, two of scarlet fever and one of typhoid fever occurred. Cases of this kind are quarantined immediately, and the State Board is notified.—Dr. J. L. Wright, H. O.

Dyer Brook.

1893. Three cases of typhoid fever were reported. Measles was quite prevalent. Care was taken against introducing the diseases into the schools.—Dr. Michael Libby, H. O.

Eagle Lake Plantation.

1893. No cases of contagious diseases are reported.—J. M. Brown, Sec.

Eastbrook.

One case of scarlet fever in 1893; otherwise no contagious diseases reported.—A. P. Bunker, Sec.

East Livermore.

1892. Of fifteen nuisances reported to the board, twelve were removed. In three tenement houses, sink spouts on top of the ground appeared to be the cause of typhoid fever. We have had two cases of scarlet fever and six of typhoid fever. Our board has taken special interest in doing its duty to make this as healthy a place as it possibly can.

1893. There have been twenty-three nuisances reported to the board; twenty-two were removed. Two cases of diphtheria and seven of typhoid fever.—S. A. Nelke, Sec.

East Machias.

1892. We have had no cases of the specified contagious diseases.—Dr. J. E. Tuell, Sec.

1893. No cases of contagious diseases reported save measles. —Dr. John A. McDonald, H. O.

Easton.

1892. One case of scarlet fever and three of typhoid fever. Precautions are taken to keep persons who are not needed away from infected cases.—D. Stanchfield, Sec.

Eastport.

1892. From seventy-five to one hundred complaints of nuisances have been received by the board, and about one hundred fifty or two hundred have been removed. We have had four cases of diphtheria and one of typhoid fever. Infectious houses have been placarded, and all communication stopped except that of the attending physician. A thorough system of drainage is needed. One horse, supposed to have glanders, was shot.

1893. Between twenty-five and thirty nuisances were attended to at the request of the board. We have had two cases of scarlet fever and ten of typhoid. A three-year-old child was poisoned by drinking oil of cedar.—Henry H. Wadsworth, Sec.

Eddington.

1892. Two cases of diphtheria and one of typhoid fever. Patients with contagious diseases are kept in a part of the house separate from the rest of the family, the house is placarded, and appropriate circulars are distributed to the family and all the neighbors. About two-thirds of the population were affected with la grippe.

1893. It has been very healthy this year. We have had only one case of typhoid fever.—D. S. Stevens, Sec.

Eden.

1892. Thirty cases of scarlet fever occurred. Infected houses are isolated until they are disinfected.

1893. Six nuisances reported to the board were all removed but one. This one will be abated next spring by building a sewer. Last June we had trouble with the water supply on account of eels getting into the main pipes. Thirteen cases of scarlet fever and four of typhoid. Otherwise there has been no marked prevalence of any disease.—Charles R. Clark, Sec.

Edgecomb.

No contagious diseases for the two years with the exception of one case of typhoid fever in 1892.—Eben Chase, Sec.

Edinburg.

No infectious diseases in the two years.—C. W. Eldredge, Sec.

Edmunds.

1893. We had two or three cases of scarlet fever, and whooping cough prevailed. The scarlet fever houses were isolated so as to keep the disease from spreading.—C. W. Hobart, Chr.

Eliot.

1892. No cases reported of infectious diseases, only one of typhoid fever besides whooping cough and German measles.

1893. This year we had sixteen cases of scarlet fever and one of typhoid. The first case of scarlet fever was not reported, hence the other cases. Owing to the negligence of the municipal officers in making appointments, there was no board to act at the time of the outbreak. One horse sick with glanders was shot by the direction of the municipal officers.—Dr. H. I. Durgin, Sec.

Elliottsville Plantation.

There has been no contagious disease in the plantation in 1893. The town has been very healthy.—H. W. Lane, Pl. Clerk.

Ellsworth.

1892. Of twenty nuisances reported to the board, sixteen were removed. Some drains empty into the street ditches and run along them for some distance uncovered, and the aldermen table all motions made relative to the city's sewerage, present and prospec-

tive, and the private citizens complain of carrying their drains so far as is in many cases necessary.

We have had two cases of scarlet fever and seven of typhoid fever. Nearly all our physicians comply with the law as regards reporting infectious diseases to the local board, but one or two openly and defiantly refuse to do so. One case of glanders in a horse, which was condemned and killed.

1893. Twelve nuisances have been reported to the board, six of which were removed and six ameliorated. There were two cases of diphtheria, one of scarlet fever, and three of typhoid fever. Placarding and strict quarantine are employed. We have had some cases of measles, mostly contracted in other towns. Our great need is a suitable system of sewerage. The experience of this board suggests the expediency of a law providing that no town shall introduce a public water supply until it provides sewers ample to care for all drainage.—Dr. Lewis Hodgkins, Sec.

Embden.

The circulars sent to this board have been distributed. We have had no contagious diseases during the two years except measles in 1892.—Gilbert W. Dunbar, Sec.

Enfield.

1892. One nuisance was removed. No cases of infectious diseases except one of typhoid. 1893. Contagious diseases have been few and far between. There have been no cases of scarlet fever, diphtheria, or typhoid fever. The people look after their water supply better and better each year, and filth is not allowed to accumulate.—A. J. Darling, Sec.

Etna.

One case of typhoid fever in 1892. In 1893 one nuisance was removed, but no cases of contagious diseases.—M. A. Arnold, Sec.

Eustis.

1892. Two aqueducts have been laid from springs. Two nuisances were removed. Besides measles there were no cases of infectious diseases save one of diphtheria and one of scarlet fever. One of the schools was closed on account of measles.

1893. One nuisance was removed. One case of diphtheria was immediately isolated and cared for. No other cases of contagious diseases.—O. A. Hutchins, Sec.

Exeter.

1892. There were six cases of scarlet fever, and two of typhoid. They were cared for by the board as the law directs. Otherwise there were no infectious diseases.—Dr. S. W. L. Chase, Sec.

1893. Measles has been prevalent, and we have had seven cases of typhoid fever.—Dr. F. H. McLaughlin, Sec.

Fairfield.

1892. Ten nuisances reported to the board were all removed as far as possible. No diseases were unusually prevalent except scarlet fever, and we had but five cases of that disease. A system of drainage is greatly needed.

1893. Eight nuisances were removed. Three cases of diphtheria and seven of scarlet fever came to the knowledge of the board and were immediately attended to.—George C. Eaton, Sec.

Falmouth.

1892. Two nuisances removed. Diphtheria, one case; scarlet fever, seven; typhoid fever, two. Infected houses immediately quarantined, and such other action as the several cases required was taken. On account of scarlet fever two schools were closed by the board, the school rooms were thoroughly disinfected, and the books used by the pupils were burned.

1893. Two nuisances were removed. There were six cases of diphtheria, sixteen of scarlet fever, and two of typhoid. Scarlet fever in a very mild form. Infected houses have been visited by one or more members of the board, the doors have been placarded, and other measures of prevention suggested by the circulars of the State Board have been taken.—Henry J. Merrill, Sec.

Farmingdale.

1892. One nuisance removed. Diphtheria, one case; scarlet fever, three; typhoid fever, three. Action, such as is directed by the State Board of Health, has been taken. Measles has been present.

1893. Two nuisances removed. No infectious diseases save whooping cough and one case of scarlet fever. — Dr. F. M. Putnam, H. O.

Farmington.

1892. A good plant of water works has been put in and completed by the Farmington Water Company, which will encourage and necessitate a better system of drainage. Ten nuisances were removed. Diphtheria, four cases; scarlet fever, five; typhoid fever, three. Cases are investigated, houses are placarded and subsequently cleansed.

1893. Three nuisances reported to the board, were all removed. Diphtheria, five cases; scarlet fever, seven; typhoid fever, eight. Houses have been placarded. Measles has been present. Sewerage is needed.—Dr. F. O. Lyford, H. O.

Fayette.

1892. No contagious diseases.—A. S. Keith, Sec.

1893. We have had only one case of typhoid fever. No reports of other contagious diseases.—S. B. Philbrick, Sec.

Flagstaff Plantation.

1893. One nuisance was removed.—B. E. Savage, Sec.

Forest City.

In 1892 we had no cases of infectious diseases save whooping cough.—Samuel Hatch, Sec.

In 1893 we had an epidemic of diphtheria, twenty cases and three deaths. Strict quarantine was enforced.—Dr. J. S. Norton, H. O.

Fort Fairfield.

1892. Two nuisances were removed. On account of scarlet fever the village school was closed. There were about fifteen cases of that disease, and ten of typhoid fever.—A. C. Cary, Sec.

1893. Four nuisances reported to the board were removed. Of infectious diseases I have only three cases of typhoid fever to report. We need a system of sewerage.—Henry O. Perry, Sec.

Foxcroft.

1892. Some sewerage has been added. Three nuisances reported were all removed. We have had no cases of diphtheria, scarlet fever or typhoid fever. 1893. Two nuisances reported were both removed. One case of scarlet fever. Teachers of schools were notified, and the houses were placarded. There has been some prevalence of measles.—H. G. Pratt, Sec.

Frankfort.

1892. Two nuisances reported were both removed. Four cases of scarlet fever; they have been looked after as the law required. —Frank L. Tyler, Sec.

1893. Scarlet fever, five cases; typhoid fever, one.—James F. Hurley, Sec.

Franklin.

1892. No cases of contagious diseases.

1893. Scarlet fever, five cases; typhoid, two.—C. T. Bunker, Sec.

Franklin Plantation.

No contagious diseases in the two years, excepting measles. I think exceptionally good care has been taken to lessen the danger from privies.—L. C. Putnam, Sec.

Freedom.

C. P. Hutchins, Sec.

Freeman.

1892. Three cases of typhoid fever. In connection with these a thorough examination was made of the buildings, the surrounding drainage, the cellar, the water supply, etc. Measles was present.—Roscoe A. Dyer, Sec.

1893. No outbreaks of infectious diseases.—N. H. Peterson, Sec.

Freeport.

1892. One case of scarlet fever, and two of typhoid.—James H. Banks, Sec.

1893. Two nuisances exist which cannot be remedied until a sewerage system is put in by the town. We had two cases of

diphtheria, two of typhoid fever, and quite a prevalence of scarlet fever, fifty-two cases have occurred. On account of the prevalence of scarlet fever some of the schools were closed, the rooms fumigated, and many books burned.—Dr. Addison R. Smith, H. O.

Friendship.

1892. Diphtheria, two cases; typhoid fever, one. Isolation and disinfection are carried out.

1893. One nuisance, but no infectious diseases.—R. R. Morton, Sec.

Fryeburg.

1892. Two cases of typhoid fever.

1893. Whooping cough prevailed, and there were two cases of scarlet fever and three of typhoid fever.—Dr. H. L. Bartlett, Sec.

Gardiner.

1892. A large number of nuisances were reported to the board; eight removed. Diphtheria, one case; scarlet fever, six; typhoid fever, three. Prompt isolation, and, after recovery or death, thorough cleansing of everything. Measles was prevalent. An extensive system of sewerage is needed.

1893. Three thousand dollars have been expended on sewers. Of thirty-one nuisances all were removed. Scarlet fever, fifteen cases; typhoid fever, two. Infectious diseases have been carefully looked after at once.—Dr. George E. Friend, H. O.

Garfield Plantation.

1893. No infectious diseases.—Wilber L. Bartlett, Sec.

Garland.

1892. Diphtheria, two cases; scarlet fever, one; typhoid fever, four.

1893. Diphtheria, three cases; scarlet fever, eight; typhoid fever, one. Proper precautions have been taken in respect to isolation, disinfection, etc. One school-house in an unhealthy location has been removed to a more suitable place.—Dr. F. A. C. Emerson, Sec.

GILEAD.

1892. Two nuisances removed. Scarlet fever, two cases; typhoid fever, two.—P. Harriman, Sec.

1893. No infectious diseases. The sanitary condition of the town is good.—E. Harriman, Sec.

GLENBURN.

For the two years we have had no cases of the contagious diseases except four of whooping cough in 1892. We have not one school-house in town that is properly ventilated. If housekeepers would take more pains to secure better ventilation for their dwellings, especially sleeping apartments, it would be much better.—John F. Tolman, Sec.

GLENWOOD.

1893. Contagious diseases have been absent during the year. —William H. Grant, Sec.

GORHAM.

1892. Four nuisances removed. Diphtheria, one case; scarlet fever, five. Whooping cough and la grippe were unusually prevalent.—Dr. A. W. Lincoln, H. O.

1893. Three nuisances removed. Diphtheria, three cases; scarlet fever, eleven; typhoid fever, one. Each infected house has been quarantined until thorough fumigation has been done. Scarlet fever was very mild. Better drainage is needed to make some parts of the town more healthy. One lady was fatally burned by the explosion of a kerosene stove.—G. W. Heath, Sec.

GOULDSBORO.

1892. One nuisance removed. One case of typhoid fever. It was promptly investigated.—B. F. Sumner, Sec.

GRAFTON.

1893. No case of contagious disease has been reported to the board.—George A. Otis, Sec.

GRAND ISLE.

1893. No cases of contagious diseases.—Florent Sanfacon, Sec.

Gray.

1892. Diphtheria, five cases; typhoid fever, three. The town has been very healthy.—Dr. J. F. Rowell, Sec.

1893. Two nuisances were removed. There were seven cases of typhoid fever.—George W. Osgood, Sec.

Greenbush.

1892. Four cases of typhoid fever are reported. At the little village of Olamon there are conditions of unhealthfulness due to polluted wells and want of a general cleaning up.

1893. Scarlet fever, eight cases; typhoid fever, two. The physicians do not report cases to the board.—H. F. Harris, Sec.

Greene.

1892. No cases of contagious diseases except four of typhoid fever. The board tries to look strictly after all work that should be looked after.

1893. One nuisance removed. Two cases of typhoid fever.—George E. Parker, Sec.

Greenfield.

1893. All the contagious diseases we have had are measles and two cases of scarlet fever. Proper action is taken when needed. —Edward Annis, Sec.

Greenvale Plantation.

1893. Five nuisances have been removed. No cases of contagious diseases except two of mumps and one of typhoid fever.—James L. Collins, Sec.

Greenwood.

1892. One nuisance removed. Three cases of diphtheria in one house. We have used all the means necessary to prevent the spreading by placarding, by isolation, etc.

1893. One nuisance removed. Infectious diseases absent during the year.—A. C. Libby, Sec.

Guilford.

1892. An aqueduct to supply a school building in the village, and three aqueducts for private residences were put down. For

contagious diseases we had whooping cough, and nine cases of diphtheria of which three were fatal. Houses were placarded, infected houses were isolated until disinfection was carred out, and public funerals were not allowed. Better drainage is needed in some places.

1893. Some improvements have been made in sewerage. This year we have had only one case of diptheria, and no cases of scarlet fever or typhoid.—John Scales, Sec.

Hallowell.

1892. Twenty-three nuisances reported were all removed. Diphtheria, four cases, scarlet fever, nine, and typhoid, one. Infected houses have been properly isolated and cared for. More sewerage is needed.—George A. Safford, Chr.

1893. Some additions to the sewer system have been made this year. About a dozen nuisances were reported, all of which were removed. About all the complaints that have come before the board have been of vaults and cesspools. We have had no trouble with them; the owners of the places have readily seen to them. We had three cases of typhoid fever. As to unhealthy localities, one or two tenement houses are made so by filthiness.—Frank Atkins, Sec.

Hamlin Plantation.

1893. We have had no contagious diseases this year.—Thomas Smith, Sec.

Hampden.

1892. Of two nuisances reported, one was removed. Diphtheria, two cases; scarlet fever, ten; typhoid fever, three. When contagious diseases appear the health officer either goes himself or arranges with the attending physician to take all the necessary precautions to prevent the disease from spreading. The diseases that have been unusually prevalent are scarlet fever, whooping cough, and la grippe.

1893. One nuisance removed. Scarlet fever, six cases; typhoid fever, five. Hampden academy was closed three weeks on account of scarlet fever.—Dr. W. H. Nason, H. O.

Hancock.

1892. Diphtheria, three cases; scarlet fever, two. In these cases no communication was allowed with the neighbors, and a nurse was furnished when required.—A. B. Crabtree, Sec.

Hanover.

1892. One nuisance removed. No cases of infectious disease.

1893. Two cases of typhoid fever, but otherwise infectious diseases have not been prevalent.—J. B. Roberts, Sec.

Harmony.

1892. Two nuisances abated. Two cases of scarlet fever. Whooping cough and German measles have been present. Patients with contagious diseases are isolated; houses are closed to outsiders; the houses placarded, and strict watch kept until the danger period is past.

1893. Four nuisances were removed. Diphtheria, two cases; typhoid fever, one. Whooping cough prevailed. We have complied with the law as near as we could, and have been prompt to look after nuisances when coming to our knowledge.—L. S. Reed, Sec.

Harpswell.

1892. Five nuisances reported were all removed. Six cases of typhoid fever.—J. S. Farr, Sec.

1893. One nuisance removed. Scarlet fever, two cases; typhoid fever, one. No other diseases prevailed to any extent.

The cases of scarlet fever were in so mild a form that it was thought to be only simple rash. A physician was not called until the last case, that of a boy, who by taking cold, was affected with a disease of the kidneys which caused the body to be badly swollen. The local physician then being called decided that the child had had scarlet fever in a mild form. The parents, being dissatisfied, sent for Dr. Mitchell of Brunswick, but he also decided it was scarlet fever. I was then notified and on investigation I found the disease had been in one family of several children, and that a card had been sent from this first family to this second family in which the children contracted the disease. These children no doubt contracted the disease by this means. The infected house was

thoroughly fumigated, and I think the restriction of the disease was owing to that action.—Augustus Sylvester, Sec.

Harrington.

1892. Scarlet fever, six cases; typhoid fever, one. Scarlet fever houses were placarded and the house isolated until it was disinfected.

As to changes and improvements in the health laws I would suggest the compulsory inspection of all premises. If the local board of health would organize societies to read popular lectures on hygiene and physiology, the lectures to be furnished by the State Board of Health, I think you would find it your best arm for reaching the people and for quickening the public conscience on health laws, which, I think, is the great need.

1893. One nuisance removed. Typhoid fever, one case.—Edwin R. McKenzie, Sec.

Harrison.

1892. Better drainage has been provided in several places. Of five nuisances, reported to the board, four were removed and the other remedied to some extent. Two cases of typhoid fever. There have been no specially prevalent diseases.

1893. The most decided improvement in the methods of disposing of excreta within the limits of Harrison village was made by the order of the local board. Three nuisances reported, and four removed. A slaughter house at Harrison village caused much trouble as it was located so near the dwelling houses as to be offensive to several families. The owner was obliged to clean it out several times before it was made satisfactory. Finally it was closed up, and has not since been used for slaughtering purposes. Diphtheria, one case; typhoid fever, twelve.

Our epidemic lasted from October 1st to the end of the year. Among the twelve cases there were two deaths. The board very anxiously sought for the cause, but failed, and no one has as yet been able to bring forward a reasonable cause in theory alone.

Our village is a very clean and healthy one, and there has been only an occasional case of typhoid fever in previous years. Many improvements in drainage and sanitation have been made in the last few years. Owing to the prevalence of this disease, the board

took extra precautions, and by its order all cess-pools, privies, and drains were thoroughly cleaned out prior to November 1st.

The cases were widely scattered, all in different families, and with no connection that can be traced. All seemed to originate within the limits of the village, except one, which was in a family living two miles outside. No case was contracted from any other case. There was no common milk supply, and no two families where a member was sick had the same regular water supply.

All water came from springs on the hillside, walled and well protected, above habitations, and having nothing but forests on a higher level. These springs or wells were low, but the water from none of them showed any trace of organic matter with the Potassium Permanganate test.

There were many cases, in addition to the twelve spoken of, which showed the beginning symptoms of typhoid in varying degrees and severity, but which failed to follow any regular febrile course.—Alphonso Moulton, Sec.

Hartford.

1893. No cases of contagious diseases reported. No disease unusually prevalent.—Dr. L. H. Maxim, Sec.

Hartland.

1892. Of six nuisances reported five were removed. Diphtheria, two cases; scarlet fever, two; typhoid fever, seven. The inmates of infected houses have been kept at home, no visiting has been allowed, and all excreta was required to be buried at a safe distance from the water supply and dwellings. All the cases of typhoid fever were from one locality, or in persons who had been living there. Our sewers should be made so to prevent, and not to create contagion.—A. W. Miller, Sec.

1893. Of five nuisances reported all were removed. We have had no cases of contagious diseases except seven of typhoid fever. In one family of ten person four cases of typhoid fever occurred, presumably from drinking polluted well water. The privy was within twenty-five feet of the well, in a gravel bed and made land. The river flows over it in high water, and when the water is low we think the soakage of the privy reaches the well. We stopped the family from using the water and had no more cases.—E. K. Fuller, Sec.

Haynesville.

1892. No infectious diseases save one case of typhoid fever.—Shepard C. Cummings, Sec.

Hebron.

There has been no serious outbreak of disease during the year 1893. No infectious or contagious diseases have been reported in town except some cases of typhoid fever. All cases in the western section of the town were traceable to the same source or origin. This source of disease became a subject of investigation by the board in the fall of 1892. We feel assured that it is now under control. Two complaints of nuisances due to the carcasses of dead animals were made to the health officer. In both cases the decaying matter was a long distance from the highway, and it confirms the value of the rule that, to avoid annoyance and trouble, the carcasses of animals that have died from disease should be immediately buried. There are cases of drainage and sewerage in which the work of the board becomes ineffectual without the support of the selectmen.

[In answer to inquiries from this office relative to the cases of typhoid fever, which occurred in 1892-93, Dr. J. C. Donham, secretary of the local board, sends the following special report, which is of great interest.—A. G. Y.]

On October 2nd, 1892, a lad twelve years old, of previous good health, was taken sick. Fever symptoms supervened. I attended the case five days, when Dr. W. P. Roberts, a homœopathic physician of Boston, (and relative of the boy) took charge. His attendance continued about ten days. Upon his return to Boston, Dr. Blake Robinson, of Sumner, Maine, (homœopathist) assumed charge, and continued his attendance to the end of the case, which recovered. The conclusion arrived at, without disagreement on the part of the medical attendants, was that, while it was not a case of typical typhoid fever, it was similar to the ordinary cases of continued fever, occurring throughout Maine in September and October, and typhoid in character; that the health officer should take necessary sanitary measures to prevent further typhoid infection.

Dr. Roberts, a close diagnostician, thought at first that the case was like what he was familiar with in the West, called remittent

fever, but upon the completion of his ten days' attendance and close observation, he said it was entirely unlike that form of fever, and believed that the typhoid bacilli alone could account for the sickness.

About this time, the daughter of Dr. E. F. Bradford, Mechanic Falls, Me., became sick, and was taken to her home. Dr. Bradford has since informed me that she suffered a long, hard run of typhoid fever, which was quite typical in character.

In a few days another young lady was attacked and confined to her room for several weeks. This case I did not see professionally, but Dr. Robinson, who attended her, subsequently informed me that it was a mild form of typhoid fever.

During the month there were five cases of enteritis; none of which yielded to treatment until a fourteen days run had completed itself. These cases were alike in symptoms and evidently from same specific cause. All but one recovered. This one, a young man, went to his home at West Bethel, Me., on the sixth or seventh day of his sickness. He became an office patient of Dr. Weeks of Portland, during the fall and winter. He returned to school in Hebron in January, still in poor health, with continued enteric disturbance, sometime acute, sometimes more chronic. He reported that this had been his condition since his attack in the previous October. On January 17th, he took cold. Pneumonia developed, and he died on January 27th, the ninth day. Dr. Weeks saw the case in consultation on the fifth and sixth days and pronounced it typhoid.

The cases thus far reported were young people who took their meals at the same boarding house. In the month of May, the landlady was attacked, had a severe three weeks' run of continued fever, in which gastric symptoms and disturbances predominated.

In March, a neighbor, a lady seventy-five years of age, had a severe run of fever of three weeks or more. The attack was sudden and pronounced. Gastric symptoms predominated through first half. About the twenty-first day there was what seemed a marked crisis in this case. She was very sick; her life was despaired of. Recovery was protracted, but finally complete.

In July, a man who kept in his hen house the refuse from the table and kitchen of this boarding house, (which he fed to the hens and pigs), was attacked with and had a long, severe run of fever, which was typhoid without question.

If the cases of enteritis, or diarrhœa, were due to a successful lodgment of typhoid bacilli in the enteric mucosa; if the cases in the older persons, which were characterized by gastric disturbances, were the result of typhoid bacilli in the stomach mucous, we had eleven cases, nine of which took their food at the same boarding place; and the infection of the other two is traceable to the same source.

The only way we can account for this source of specific infection is that in the summer of 1891 there was a case of continued fever in this house. It was seen professionally but once by the writer. The young lady was sent to her home in Paris, where she had a long, severe run of typhoid fever. It is more than probable that the dejections were emptied into a privy vault on the premises before it was known that it was a case of fever.

The privy vault is located near, too near, the house proper, where kitchen work is done. An ice chest, or victual closet was only four or five feet from the privy.

If some kinds of food, especially milk, do provide elements and conditions favorable to the growth and culture of bacilli, or in any way become the depository of disease germs, here was a way for the typhoid bacilli to find their way to the digestive tracts of these people.

The board of health, acting upon these facts, was sustained by the owners of the property. We burned the vault and timbers upon which it rested, removed the earth for ten feet square around it to one foot in depth; refilled the space with gravel and sand; disinfected everything within reach; spared neither expense nor pains; and believe the source of the outbreak is eradicated.—Dr. J. C. Donham, H. O.

Hermon.

1892. Two cases of scarlet fever. Nine persons were poisoned by eating cheese, the resulting symptoms resembling cholera morbus.

1893. One nuisance was removed, and we had one case of typhoid fever.—Dr. F. P. Whitaker, Sec.

Highland Plantation.

1893. No infectious diseases, and but very little sickness from other causes.—J. R. Ryant, Sec.

Hiram.

1892. Many persons have discarded the old well for water from the hill-sides, brought by pipes, and much improvement has been made in relation to privy vaults. Three nuisances were removed. Diphtheria, one case; typhoid fever, three cases. The family in which the case of typhoid fever occurred used water from a stagnant brook which had the wash of a large hill-side pasture.—John Pierce, Sec.

1893. Scarlet fever, two cases; typhoid fever, two. Immediate action in accordance with the recommendation of the State Board. Mumps was prevalent.—Dr. C. E. Wilson, H. O.

Hodgdon.

1892. There were two cases of typhoid fever. We visited the cases and left the necessary information as to precautions.

1893. Diphtheria, one case; scarlet fever, one; typhoid fever, two. Measles was prevalent.—Moses Benn, Sec.

Holden.

1892. Two nuisances were removed. One nuisance, that of a dead horse, caused a great deal of trouble. The horse was put there by a person other than the owner of the land. It had been there four or five weeks before we were notified. The local board finally burned it. The man who owned the land was notified, but failed to attend to it. He promised to pay the cost, but has not as yet. Scarlet fever, two cases; typhoid fever, two; and there were several cases of whooping cough.

1893. Two nuisances were removed. Scarlet fever, four cases; typhoid fever, two.—Philander L. Pond, Sec.

Hollis.

1892. Three nuisances were removed. Diphtheria, two cases; typhoid fever, one. Prompt attention was given to these cases. Whooping cough prevailed.—Thomas J. Carle, Sec.

1893. No contagious diseases reported, save measles.—S. G. Rumery, Sec.

Hope.

1892. No contagious diseases.

1893. One nuisance occurred, the circumstances in connection with which have been communicated to the State Board.—Henry H. Payson, Sec.

Houlton.

1892. An extension of the water system has been made. All nuisances, reported to the board, have been removed. Diphtheria, fourteen cases; scarlet fever, thirty; typhoid fever, eight. The epidemic of scarlet fever was mild. Many cases occurred in which no physician was employed, and, therefore, many cases did not come to the attention of the board. Personal visits were made to the infected houses and prompt isolation put into effect. Whooping cough prevailed. The changes in the health laws, which the experience of this board suggests, are more stringent regulations as to the prevention of the spread of measles, and some way of enforcing the law regarding the reporting of contagious diseases by the parents when a physician is not required.

1893. About fifty nuisances were reported to the board, all of which were removed as far as possible. Diphtheria, one case; scarlet fever, twelve; typhoid fever, seventy. Houses were disinfected, under our direction, as far as possible. Measles, pneumonia and typhoid fever were the diseases that were unusually prevalent.—Dr. Charles E. Williams, Sec.

Howland.

1892. Four cases of typhoid fever occurred, all in one house. They were looked after by the board.—James O. Davis, Sec.

1893. One case of typhoid fever. Chloride of lime, as a disinfectant, was used freely. There were several cases of measles. The only nuisance discovered by the board was the carcass of a deer found in the boom of the Piscataquis river, which was removed and buried by one of the members of the board.—C. J. Cummings, Sec.

Hudson.

1893. No contagious diseases reported.—Andrew J. Potter, Act'g Sec.

Hurricane Isle.

1892. No cases of infectious diseases. All sources of filth that might cause sickness have been looked after, and if any one came to the town sick the case has been kept under observation.—E. G. Rolfe, Sec.

1893. One nuisance removed. No contagious diseases excepting German measles. A general clearing up of everything of an unhealthful nature on the island was made, and the rubbish carted away. In the spring notices were posted up requiring all persons to remove all filth from their premises.—M. H. McIntyre, Sec.

Industry.

1892. One nuisance was removed. Diphtheria, six cases; typhoid fever, one. In caring for these cases the requirements of the law were followed. Measles was present.

1893. We had two cases of scarlet fever this year, and whooping cough was about.—H. B. Luce, Sec.

Island Falls.

1892. There have been no cases of contagious diseases save measles. It has been remarkably healthy all the year.—George H. Donham, Sec.

1893. We had six cases of typhoid fever, and measles was present.—Dr. F. F. Bigelow, Sec.

Isle au Haute.

1892. No cases of contagious disease occurred, and there has been no sickness worth mentioning. Our town is in a good healthy condition.

1893. There has been no sickness in town except three cases of measles, which occurred in one house. Precautions were taken not to have the disease spread. We have excellent water, good air, good drainage and no nuisances.—Edwin Rich, Sec.

Islesboro.

1892. Scarlet fever, one case; typhoid fever, one. There were some cases of measles. One boy was drowned by falling from a sail boat.

1893. Scarlet fever, seven cases; typhoid fever, one case.—J. A. Sprague, Sec.

Jackman Plantation.

1893. Two nuisances were reported to the board, one of which was removed. The nuisance that remains is the emptying of the sewage, excreta, etc., of the hotel into the river about one hundred yards above the point where water for family use is taken for several houses.—Dr. T. J. Murphy, H. O.

Jackson.

1892. No cases of the specified contagious diseases have been reported to the board. German measles entered the school in District No. 6, and it was closed for two weeks. But six of the pupils took the disease.—Mark S. Stiles, Sec.

1893. No infectious diseases this year.—D. D. Gould, Sec.

Jay.

1892. Scarlet fever, two cases; typhoid fever, two. Measles was present and one school was closed on account of this disease. We think cases of measles should be subjected to the same regulations as scarlet fever, diphtheria, etc.

1893. One nuisance was removed. Diphtheria, one case; scarlet fever, two; typhoid fever, four. These cases were investigated and proper precautions taken.—H. H. Allen, Sec.

Jefferson.

1892. Diphtheria, one case; scarlet fever, one. Measles, whooping cough, and pneumonia were especially prevalent.

1893. Three cases of typhoid fever occurred, caused, as is supposed, by the water from a well that had been closed and unused for three years. One case of tuberculosis in a cow occurred.—J. J. Bond, Sec.

Jonesboro.

1892. Six nuisances were reported to the board, all of which were removed. None of the specified contagious diseases. One case of drowning. I would recommend that there be a law providing for a house to house inspection twice a year.

1893. Six nuisances reported to the board, were all removed. No cases of diphtheria, scarlet fever, or typhoid fever, but there was quite an epidemic of measles and whooping cough.—E. M. Watts, Sec.

Jonesport.

1892. One nuisance removed. Of infectious diseases, only three cases of scarlet fever. We have quarantined the houses at once, and had them properly cleansed.

1893. Diphtheria, three cases; typhoid fever, one. The cases of diphtheria were in a mild form. The houses were placarded and every precaution was taken. After recovery, the premises were thoroughly disinfected.—J. W. Peasley, Sec.

Kenduskeag.

1892. Two nuisances reported to the board were removed. Besides measles we had one case of scarlet fever and one of typhoid fever.

1893. Three nuisances were removed. We have had no cases of contagious diseases save measles.—Dr. J. F. Benjamin, H. O.

Kennebunk.

1892. Six nuisances were removed by the board. Diphtheria, twelve cases; scarlet fever, twenty-five; typhoid fever, sixteen. Every case of infectious disease has been looked after and all necessary precautions taken. Whooping cough, cerebro-spinal meningitis, and measles were unusually prevalent. Improvements should be made in water supply and sewerage. Two cases of poisoning from sewer gas occurred, and six cases of severe poisoning from canned beef and fish; all recovered. Several cases of tuberculosis in cattle, and one case of glanders in a horse,—all disposed of.—Dr. Frank M. Ross, H. O.

Kennebunkport.

1892. Thirteen cases of nuisances have come to our knowledge, all of which we have caused to be abated. Three cases of typhoid fever have occurred. Proper ventilation in school-houses is needed.

1893. Six nuisances were abated. Scarlet fever, three cases; typhoid fever, one. Infectious houses are placarded and placed under strict quarantine; a keeper being put in charge, if necessary.

Notices were printed and distributed throughout the town, calling attention to the fact that immediate attention must be given to the proper drainage of cesspools, disposal of garbage, etc.—William H. Cluff, Sec.

Kingfield.

1892. Three nuisances were reported to the board, two of which were removed. One of the nuisances is referable to an under-ground drain that takes all the waste from one house, two stores, and the hotel, and comes out in a field in front of the hotel in the very centre of the village. The citizens insist that this nuisance be abated. We have referred the matter to the selectmen, but have not succeeded in having anything done about it. Measles was prevalent and we had two cases of typhoid fever.—Edwin Ellis, Sec.

1893. Two nuisances reported, one of which was removed. Eleven cases of tyhoid fever.—George H. Winter, Sec.

Kingman.

1893. One nuisance was removed. Five cases of scarlet fever. Measles and pneumonia were unusually prevalent.—Dr. R. J. Love, H. O.

Kingsbury Plantation.

1893. There have been no contagious diseases excepting whooping cough.—Charles Strickland, Sec.

Kittery.

1892. Four nuisances were removed. There were nine cases of typhoid fever. A system of water supply and drainage is needed. We think the outbreak of typhoid fever was caused by impure drinking water.—Dr. L. O. Buzzell, Sec.

1893. Five nuisances were removed. Two small pools in the centre of the village have been drained. Scarlet fever, one case; typhoid, two. In the case of scarlet fever the house was quarantined and the patient isolated. The excreta of typhoid fever patients was disinfected and buried, the clothing was disinfected and that which was badly soiled was burned. One case of typhoid fever was caused by drinking water from a stagnant pool; the other case was contracted out of town.—Dr. Edw. E. Shapleigh, Sec.

Knox.

1892. No cases of contagious diseases save one of measles. Action was taken to keep the disease from the schools.

1893. Two cases of typhoid fever. These were looked after immediately.—J. H. Brown, Sec.

Lagrange.

1892. Diphtheria, one case; scarlet fever, seven; typhoid fever, one doubtful. The State Board is notified of cases of infectious diseases, the cases are isolated so far as practicable, disinfection and fumigation are provided after death or convalescence.

1893. Diphtheria, one case; scarlet fever, about twenty-five cases; typhoid fever, two. I say about twenty-five cases of scarlet fever, for the reason that the book which I carried in my pocket and in which I kept an account of contagious diseases has been lost.—H. W. Blake, Sec.

Lake View Plantation.

1893. The plantation is in a good sanitary condition. There have been no cases of contagious diseases.—James J. Tenney, Sec.

Lamoine.

1892. No cases of infectious diseases reported save one of scarlet fever.

1893. Ten cases of scarlet fever. Infected houses have been placarded and quarantined until disinfected.—W. S. Hodgkins, Sec.

Lee.

1892. One drain pipe was put in for drainage and sewerage in the village. Two cases of typhoid fever occurred.—J. G. Ricker, Chr.

1893. Three nuisances were reported, two of which were removed. As this is a rum town there is one nuisance which we could not remove. We had two cases of typhoid fever. The houses were visited and placarded and instructions given to the inmates and to the neighbors. One district had all the measles it could take care of, but by constant attendance we kept it in that district. I have examined the school-houses in town as to the

condition of the privies and other arrangements.—James M. Daniels, Sec.

Letter E Plantation.

1893. One nuisance was removed. No contagious diseases.—Henry L. Lufkin, Sec.

Leeds.

1892. Three nuisances were removed. Scarlet fever, two cases; typhoid fever, three. Houses were placarded and quarantined.—Measles was prevalent.—H. M. Brewster, Sec.

Levant.

1892. We had no contagious diseases save three cases of scarlet fever and a prevalence of whooping cough. The scarlet fever families, three houses, were quarantined.—C. W. Fernald, Sec.

Lewiston.

1892. Eighty-four nuisances reported to the board were removed. We had five cases of diphtheria, six of scarlet fever and ten of typhoid fever. In cases of diphtheria and scarlet fever the houses were placarded, and in all cases they were carefully looked after and disinfected.—John Z. Campbell, Sec.

1893. Improvements have been made in the sewers. One hundred and twenty-seven nuisances were reported to the board, of which 112 were abated. There were five cases of diphtheria and forty-three of scarlet fever. But few of the cases of infectious diseases originated in the public schools and these schools were disinfected immediately.—Dr. L. E. N. Matte, Sec.

Lexington Plantation.

1893.—We had no contagious diseases.—F. L. Norton, Sec.

Liberty.

1892. No cases of infectious diseases.—J. O. Johnson, Sec.

1893. This year we have had no contagious diseases save measles.—J. O. Johnson, Chr.

Limestone.

1892. Two nuisances reported to the board were removed. There were two cases of typhoid fever and some whooping cough.

1893. Two nuisances were removed. Scarlet fever, seven cases; typhoid fever, eight. We think that four of the cases of typhoid fever were from bad water.—A. D. Hatfield, Sec.

Limerick.

1892. Two nuisances removed. One case of scarlet fever.—Dr. J. D. Haley, Sec.

Limington.

1892. Two cases of typhoid fever. A careful supervision is kept over cases of typhoid fever and a cleansing of the house follows convalescence. The two cases of typhoid fever had no connection with each other. Two horses died last spring, having the symptoms of la grippe followed by pneumonia.

1893. One nuisance was removed. Scarlet fever, five cases; typhoid fever, three. Measles and pneumonia were quite prevalent. The diarrhœal diseases of children were not so prevalent.—L. P. Thompson, Sec.

Lincoln.

German measles and one case of typhoid fever we have to report for the year 1892.

In 1893 one nuisance was removed, but of the specified contagious diseases we have none to report.—Dr. S. W. Bragg, Sec.

Lincoln Plantation.

1893. We have our local board, but there has been no work to do.—F. T. Pennock, Sec.

Lincolnville.

1892. Four nuisances were removed. Diphtheria, four cases; typhoid fever, three.

1893. Four nuisances removed. We had two cases of typhoid fever.—Dr. E. F. Brown, H. O.

Linneus.

1892. Of contagious diseases we had only a few cases of measles in a mild type, all of which received only domestic treatment.

1893. There were this year three cases of typhoid fever. One child died from the effects of a burn due to its clothes catching fire.—Dr. Robert Boyd, H. O.

Lisbon.

1892. Twenty-eight nuisances were reported, all of which were removed. Diphtheria, three cases; scarlet fever, sixteen; typhoid fever, three. Houses have been strictly quarantined and disinfected. At Lisbon, defective sewerage and bad water is undoubtedly the cause of some sickness.—Charles H. Miles, Sec.

1893. There were reported to the board twenty nuisances. These were all removed. Diphtheria, two cases; scarlet fever, eight; typhoid fever, twenty-four. Water supply and a sewerage system are needed.—A. E. Jordan, Sec.

Litchfield.

1892. Three nuisances removed. No disease was unusually prevalent. One case of typhoid fever.

1893. Eight nuisances were removed. Scarlet fever, three cases; typhoid fever, two. These were attended to as the law requires.—Gardiner Roberts, Jr., Sec.

Littleton.

1892. Diphtheria, five cases; typhoid fever, three. These cases were reported at a late date, some of them after they were fully recovered. When notified in time, cases were visited, circulars distributed, and provisions made for disinfection. An improvement in the sanitary condition of the town I think might be effected by education in physiology and hygiene.

1893. Two nuisances were removed. We had fifteen cases of typhoid fever in six houses and one camp. The houses were visited by the secretary and proper instructions by circulars and otherwise furnished.—H. A. Hall, Sec.

Livermore.

1893. I have to report only three cases of typhoid fever. One of the cases seemed to have come from improper care of waste at the corn canning factory.

The experience of this board suggests the advisibility of a law providing for a thorough examination of all dairy farms sending cream to factories. The inspection to be made at regular intervals and to be compulsory.—Dr. H. A. Smith, H. O.

Long Island Plantation.

1893. There has been but one death during the year in the plantation and no contagious diseases. All the sanitary requirements needed to maintain a healthful condition of the population are looked after.—F. E. Gilman, Sec.

Lovell.

1892. There have been no cases of contagious diseases reported.

1893. One case of typhoid fever was reported to the board. The house was quarantined, excreta disinfected and buried, etc.—Dr. C. P. Hubbard, Sec.

Lowell.

1892. Of three nuisances reported, one only was removed. We had four cases of typhoid fever. Better drainage is needed.—M. O'Halloran, Sec.

1893. The following by-laws have been adopted by the local board of health of this town, and have been approved by Hon. William P. Whitehouse, Justice of the Supreme Judicial Court.

Sect. 1. It shall be the duty of every owner, agent, or superintendent of a tannery to prevent the accumulation of fleshings or other offensive waste matter in or about the tannery over which he has ownership or authority. All fleshings shall be removed daily, and buried at the time of removal.

Sect. 2. No fleshings shall be deposited near enough to any highway to be offensive to persons travelling in said highways, nor near enough to dwellings or places of business to be offensive to persons dwelling or staying therein.

Sect. 3. The removal of fleshings and other waste matters of tanneries, and the disposal of them shall be only in strict accordance with the orders of the local board of health.

SECT. 4. No person shall use any building as a slaughter-house without a written permit issued and signed by the local board of health, and any person using any building as a slaughter-house shall keep it and its surroundings in such condition that they shall not become offensive to persons in dwelling houses, places of business, or in the highways.

SECT. 5. All accumulations of refuse matter, such as swill, waste of meat, fish, bones, decayed vegetables, and filth of every kind, which may decompose and generate disease germs or unhealthy gases, and become a source of danger to the public health, shall not be permitted to remain longer than a reasonable time to remove the same, not exceeding forty-eight hours. Otherwise the statute and town ordinance relating thereto will be enforced against the delinquent.

SECT. 6. All animals dying within the limits of the jurisdiction of the local board of health of the town of Lowell, shall be promptly buried in such places and in such manner that they shall not endanger the health of the citizens of Lowell.

SECT. 7. All houses, out-buildings, and premises within the jurisdiction of the local board of health of Lowell, must at all times be kept in a clean, healthy condition, and any and all matters, and things, and sources of filth that may tend to constitute a nuisance, or a source of danger to the public health, must be promptly removed and abated; otherwise the required notices will be given and the penalty provided by statutes will be enforced.

SECT. 8. Any and all persons engaged in removing fleshings, within the jurisdiction of the local board of health of Lowell, shall use tight carts or wagons, and such carts or wagons shall not be used upon any public road except during the hours between 10 P. M. and 4 A. M.

SECT. 9. Cellar drains, sink spouts, and drains from all premises, and all refuse from such sink and other drains, shall be disposed of in a manner satisfactory to the local board of health, and the premises kept neat and free from all matter that can endanger the public health.

(Chapter 123 Public Laws of 1887.)

SECT. 26. Any person who shall wilfully violate any of the provisions of this act, or said regulations and by-laws, the penalty for which is not herein specifically provided for, and any person

who shall wilfully interfere with any person or thing, to prevent the execution of the provisions of this act, or of said regulations and by-laws, shall be guilty of a misdemeanor, and, upon conviction thereof, shall be subject to a fine of not more than fifty dollars.—Levi B. Edgecomb, Sec.

Lubec.

1892. One nuisance removed. One case of typhoid fever.—James B. Neagle, Chr.

1893. A sewer has been built by private enterprise from the top of the hill to tide water. Some cases of measles and whooping cough have been present. No cases of the specified contagious diseases.—James B. Neagle, Sec.

Ludlow.

1893. There were about thirty cases of scarlet fever, and six of typhoid fever. Two deaths from typhoid. These cases were not reported to the board, and no action was taken. Scarlet fever entered one school; no action was taken.—David Small, Sec.

Lyman.

1892. Six cases of diphtheria in one house. Whooping cough prevailed to quite an extent.

1893. Diphtheria, four cases; scarlet fever, one. In connection with these cases, the houses were placarded and no one admitted but the doctor and the nurse.—A. J. Blanchard, Sec.

Machias.

1892. Scarlet fever, five; typhoid fever, three cases. The infected houses have been placarded and the premises have been disinfected after the disease was done. The diarrhœal diseases were more than usually prevalent. More than anything else in this town a supply of pure water is needed. If we had this, our town would be unsurpassed for healthfulness. Two of the cases of typhoid fever seemed to be referable to a sink drain, which had, for several years, run upon the ground under the kitchen, where it had penetrated the soil for a long distance. A terribly severe gastro-enteritis in one case was caused by eating freely of deviled ham. Many of the horses have had influenza. In some cases, the death of the animals was the result.

1893. Two nuisances were removed. Scarlet fever, fifty cases; typhoid fever, four. Infected houses have been immediately placarded, children have been taken from school, and the family have been kept from public meetings of all kinds. Measles prevailed.

One severe case of cess-pool poisoning in a carpenter who was repairing the under part of an out-building. There was a violent onset and protracted recovery. Several cases of poisoning have resulted from eating canned corned beef.—Dr. Henry H. Smith, H. O.

Machiasport.

1893. There have been no cases of contagious diseases so far as we know, with the exception of a few cases of measles. We have been very fortunate this year.—C. W. Robinson Sec.

Madawaska.

1892. No contagious diseases reported, save measles and whooping cough.

1893. No cases of infectious diseases reported. Nothing dangerous happened.—Arthur Daigle, Sec.

Madison.

1892. There has been some change for the better in some parts of the town as regards the water supply. Diphtheria, one case; typhoid fever, three. These cases have been attended to.

1893. Four nuisances were removed. Diphtheria, three cases; typhoid fever, five.—Charles W. Dyer, Sec.

Madrid.

1892. There has been very little sickness this year. Scarlet fever was prevalent in some of the towns around us, but by closing some of the schools and keeping our children at home we have escaped.—Lewis P. Rowe, Sec.

Macwahoc Plantation.

1893. There has been but very little sickness, with no contagious diseases.—O. M. Randall, Sec.

Manchester.

1892. So far as is known we have had for contagious diseases only one case of diphtheria. The doors of the infected house were placarded and precautions taken to prevent infection.

1893. We have had not one case of the specified contagious diseases.—G. M. Knowles, Sec.

Mapleton.

1892. Scarlet fever, three cases; typhoid fever, two. Infected houses were quarantined and disinfected. Cholera infantum was quite prevalent.

1893. Scarlet fever, one case; typhoid fever, four. Precautions were taken in the way of placarding and disinfecting.—Levi W. Hughes, Sec.

Mariaville.

1892. But little sickness occurred. There was one case of typhoid fever. One nuisance reported, not removed.

1893. No infectious diseases.—George A. Frost, Sec.

Marion.

1892. No infectious diseases.

1893. Scarlet fever, two cases; typhoid fever, two. Infectious houses were quarantined.—Benj. L. Smith, Sec.

Marshfield.

1892. No contagious diseases.

1893. No contagious diseases save measles which entered one of the schools and required its closure.—Levi B. Thaxter, Sec.

Mars Hill.

1893. No contagious diseases except measles.—B. F. Pierce, Sec.

Masardis.

1892. One case of typhoid fever.

1893. One case of typhoid fever.—Fred W. E. Goss, Sec.

Mason.

1892. There were six or eight cases of scarlet fever.—F. I. Bean, Sec.

1893. Two nuisances were removed. With the exception of whooping cough, there were no contagious diseases. Whooping cough was introduced into one of the schools. I took care to quarantine the family, but one young man, son of our chairman, persisted in going.—Addison S. Bean, Sec.

Matinicus Isle Plantation.

1893. No disease was unusually prevalent, and for contagious diseases we had only one slight case of diphtheria.—E. E. Ames, Sec.

Mattawamkeag.

1892. No contagious diseases reported.—F. J. Fiske. Sec.

Mattamiscontis.

1892. No contagious diseases.

1893. No contagious diseases have occurred.—P. W. Roberts, Sec.

Maxfield.

1892. No contagious diseases.

1893. Only one nuisance was reported and that was disposed of. No infectious diseases.—James Wiley, Sec.

Mayfield Plantation.

1893. No trouble reported.—Laforest Campbell, Sec.

Meddybemps.

1892. No infectious diseases this year.—John S. Bridges, Sec.

1893. Nothing but measles and whooping cough.—A. J. Allen, Sec.

Medford.

1892. Five cases of scarlet fever occurred in one family. The house was placarded.

1893. No contagious diseases have been reported. Some of our school-houses are badly heated with a stove pipe overhead and the floor is cold.—S. O. Dinsmore, Sec.

Medway.

1892. No contagious diseases for the year.—S. Pomroy, Sec.

1893. Three cases of typhoid fever.—Thomas Fowler, Sec.

Mercer.

1892. Neither infectious diseases nor nuisances reported to the board.

1893. No infectious diseases this year.—C. H. Girdler, Sec.

Merrill Plantation.

1893. We have had only one case of scarlet fever in the way of infectious diseases. On account of this case the school was closed, the house was placarded, circulars were distributed and disinfection provided.—James C. Sholler, Sec.

Mexico.

1892. Two nuisances were removed. Two cases of typhoid fever. Prompt action was taken.—L. H. Harlow, Sec.

No board was organized in 1893.—Dr. H. J. Binford, Sec. for 1894.

Milbridge.

1892. One case of scarlet fever and four of typhoid. The houses were placarded, the inmates kept from others as much as possible. Better drainage would improve the sanitary condition.

1893. One nuisance was removed. We have had thirty-three cases of scarlet fever, two of which ended fatally, and four cases of typhoid fever. The family was isolated until the house was disinfected. One case of cerebro-spinal meningitis, and measles to some extent.—Dr. George Googins, Sec.

Milford.

1892. Several nuisances were reported to the board, and all were removed temporarily. Sink drainage gave us the most trouble in this town, as they mostly let the water run out on top of the ground, and every one constitutes a nuisance. Five or six cases of scarlet fever and one of typhoid.

1893. This year we have had no cases of infectious diseases to report.—M. W. Sawyer, Sec.

Minot.

1892. Of the few nuisances reported to the board, all were removed. We had five or six cases of typhoid fever. Better drainage is needed in the village.—Dr. C. H. Tobie, Sec.

1893. Four nuisances were removed, but we have had no cases of infectious diseases.—A. B. Deering, Sec.

Monhegan Plantation.

1893. We have had no cases of contagious diseases this year. —Alonzo W. Davis, Sec.

Monmouth.

1892. Two nuisances were removed. Nuisances are too often committed by leaving dead animals unburied. We have had three cases of scarlet fever, and a few cases each of chicken-pox and measles. Action, in accordance with the provisions of the law, is taken. The best way for improving the sanitary condition is the general enlightment of the inhabitants on public health matters.—Dr. D. E. Marston, H. O.

1893. Two cases of scarlet fever and four of typhoid. Some member of the board has visited the infected houses and quarantined them when necessary.—Dr. E. P. Marston, Sec.

Monroe.

1892. Two nuisances removed. A glandered horse killed by Dr. Bailey gave us some trouble.

1893. Diphtheria, one case; typhoid fever, five. These cases have been looked after by the board. Measles was present. One fatal case of poisoning resulted from drinking the essence of checkerberry.—Dr. C. C. Whitcomb, H. O.

Monson.

1892. We had three cases of typhoid fever. Better sewerage is needed.

1893. Two nuisances have troubled us, one caused by slaughtering on the premises, and keeping hogs beneath the stable.—D. J. Jackson, Sec.

Monticello.

1892. No infectious diseases reported.—G. W. Lowell, Sec.

1893. Scarlet fever, three cases; typhoid fever, nine. Isolation has been strictly enforced, and the advice of the physician has been acted upon generally.—O. A. Stanley, Sec.

Moose River Plantation.

1893. We have had no cases of infectious diseases.—Cyrus Newton, Sec.

Moro Plantation.

1893. We have had no contagious diseases for the year.—Patrick Darling, Sec.

Morrill.

1892. Contagious diseases have been absent the whole year.—J. R. Mears, Chr.

1893. With the exception of measles, no contagious diseases this year.—D. O. Bowen, Sec.

Moscow.

1892. We had two fatal cases of typhoid fever, in one house. The house was immediately visited by the secretary who left circulars and gave such instructions as were necessary. No other contagious diseases.

1893. No cases of contagious diseases save six of measles. More care should be taken in locating wells.—Albert Burke, Sec.

Mount Chase.

1892. No contagious diseases. Our town has been in a very healthful condition. We usually put up notices ten days before making our inspection, and when we come around we find the houses in a good sanitary condition. Quite a number of persons were made very sick by using soda containing arsenic. One death resulted and three others lost the use of their limbs for some time.

1893. One nuisance was removed. Four cases of scarlet fever. The houses were placarded, and no one was admitted only those in attendance. After recovery, thorough fumigation was done.—E. A. Cooper, Sec.

Mount Desert.

1892. There were six cases of scarlet fever in the way of infectious diseases. The village has followed out the suggestions of the board in the matter of sewerage.—Lyman H. Somes, Sec.

Mount Vernon.

1892. We had one case of typhoid fever.

1893. No contagious diseases this year, save one case of typhoid fever and some of whooping cough.—Dr. H. F. Shaw, Sec.

Naples.

1892. We have had one case of typhoid fever, and measles was quite prevalent during the summer.

1893. Two nuisances were removed. No contagious diseases. We have been exceptionally free from contagious diseases.—Philip O. Cannell, Sec.

Nashville Plantation.

1892. We have had three cases of scarlet fever, one fatal. Placards were put up and disinfection was done as well as we knew how.—Eugene Hill, Sec.

New Canada Plantation.

1893. No infectious disease has been present.—Thomas Daigle, Sec.

Newcastle.

1892. There have been a few cases of whooping cough and one case of typhoid fever. An examination showed that a bad condition of the privies existed in many of the schools. The cleansing and deodorizing of them was attended to by the school agents when the necessity of it was pointed out to them.

1893. One very excellent piece of improvement has been made in the way of drainage. No infectious diseases.—D. S. Glidden, Sec.

Newburg.

1892. Scarlet fever, two cases; typhoid fever, one.—C. H. Whitcomb, Sec.

Newfield.

1892. Within the past year, most of the village of West Newfield made great improvement in water supply, bringing it from springs. All the contagious diseases we have had were two cases of diphtheria.—G. O. Hannaford, Sec.

New Gloucester.

1892. Diphtheria, five cases; typhoid fever, one. The secretary has visited the families and seen that the precautions recommended by the State Board of Health were properly carried out.—John I. Sturgis, Sec.

1893. Two nuisances were abated. No infectious diseases save German measles.—G. Z. Benson, Sec.

New Limerick.

1892. Scarlet fever, one case; typhoid fever, eleven. The board has seen that the infectious persons had medical attendance; disinfectants were liberally used; the patients were kept apart from the other members of the family; and nurses were provided. We had some cases of measles.—Ellsworth Lougee, Sec.

Newport.

1892. One nuisance was removed. One case of typhoid fever.

1893. One nuisance abated. Scarlet fever, seven cases; typhoid fever, one. Infected houses have been placarded and sanitary precautions have been taken by the health officer. The sanitary condition of Newport is good, and it is a very healthy town.—Frank M. Shaw, Sec.

New Portland.

1892. There is a constant improvement going on as to the care of the water supply. Three nuisances have been abated. Four cases of typhoid fever. Directions were given for proper disinfection in connection with these cases. Better method of disposing of sink water and excreta is required.

What is really needed most in country towns is larger and better ventilated sleeping rooms. Many rooms, eight by ten feet, may be found, where father, mother, and one or two children, sleep and

inhale the vitiated air a third part of each twenty-four hours.—Dr. W. H. Stevens, Sec.

Newry.

1892. Diphtheria, one case; typhoid fever, one.

1893. One nuisance abated. One case of typhoid fever, and some of whooping cough and measles.—Levi W. Killgore, Sec.

New Sharon.

1892. Four nuisances were removed. One case of diphtheria.

1893. One nuisance was removed. No infectious diseases reported.—D. R. Hargraves, Sec.

New Sweden Plantation.

1893. We had one case of typhoid fever.—A. E. Ringdahl, Sec.

New Vineyard.

1892. Of three nuisances reported to the board, all were removed. One case was placarded and quarantined for scarlet fever, but it proved not to be that disease.—G. H. Pratt, Sec.

Nobleborough.

1892. Scarlet fever, two cases; typhoid fever, one. Infected houses were placarded, circulars distributed, and the rest of the work has been left to the attending physician who co-operates with the board.

1893. Two cases of typhoid fever, and some cases of measles and whooping cough.—John M. Winslow, Sec.

Norridgewock.

1892. Scarlet fever, one case; typhoid fever, one. Measles was also quite prevalent.

1893. All the contagious diseases we had were three cases of scarlet fever.—E. A. Hilton, Sec.

North Berwick.

1892. There have been several improvements in drainage and sewerage. Four nuisances were reported to the board, all of which were removed. Diphtheria, three cases; typhoid fever, two.

Immediate isolation and the application of disinfecting agents are not neglected. German measles entered the schools. The walls were disinfected by whitewashing and sulphur fumigation.

1893. Two nuisances were abated. Diphtheria, two cases; typhoid fever, one. Diphtheria cases were quarantined and afterwards fumigation was done. Good drainage and the removal of all filth would improve the sanitary condition of the town.—H. A. Butler, Sec.

Northfield.

1892. We have had no contagious diseases.—E. M. Smith, Sec.

1893. No cases of diphtheria, scarlet fever, or typhoid fever, but measles and whooping cough were prevalent.—V. M. Smith, Chr.

North Haven.

1892. Three nuisances abated. No contagious diseases save measles and whooping cough.—Harrison Beverage, Sec.

1893. Two nuisances abated. No contagious diseases.—Robert B. Quin, Sec.

Northport.

1892. No contagious diseases. Two nuisances abated. We have had comparatively little to do, but we hold ourselves in readiness to discharge our duty strictly.

1893. One case of typhoid fever is all in the way of infectious diseases.—F. A. Rhodes, Sec.

North Yarmouth.

1892. We have had one fatal case of diphtheria.

1893. We have had eight cases of scarlet fever.—Dr. Wm. Osgood, H. O.

Norway.

1892. One nuisance was removed. Scarlet fever, seven cases; typhoid fever, three. The action taken in these cases is isolation of the patient as far as possible, placarding, the use of antiseptics, investigate the source of the contagion, and remove it if possible. Measles was quite prevalent in the beginning of the year.

The board has made a special effort to find bad wells and other sources of dangerous drinking water supply among the farming community.

1893. Scarlet fever, six cases; typhoid fever, five. We have made every effort to check the spread of contagious diseases.—Dr. F. N. Barker, Sec.

No. 14 Plantation.

1893. No contagious diseases reported.—John O. Tuell, Sec.

No. 33 Plantation.

1893. We have had no contagious diseases. Prompt action would have been taken had there been cases.—John R. Shuman, Sec.

Oakfield Plantation.

1893. We had three cases of typhoid fever,—reported by J. H. Bartlett.

Oakland.

1892. Five nuisances were removed. Scarlet fever, five cases; typhoid fever, six. Stagnant water is the cause of unhealthiness in some localities.

1893. Two nuisances were reported and removed. We had five cases of scarlet fever.—H. W. Wells, Sec.

Old Orchard.

1892. One nuisance was removed. Scarlet fever, one case; typhoid fever, three.

1893. Two nuisances were removed. We had one case of typhoid fever.—N. W. Ordway, Sec.

Old Town.

1892. Forty nuisances were reported to the board, thirty-seven of which were removed. Sewers have been extended about 2,000 feet. We had twenty cases of scarlet fever and twenty-five of typhoid. Among the precautions taken, the supervisor of schools has been notified and infected houses have been closed to visitors.

Contagious diseases are not reported by the attending physician in accordance with the provisions of the law. Scarlet fever entered the schools, but no action was taken for the cases were not reported to the board.

There are many unhealthy localities. The causes are lack of sewerage, lack of interest on the part of the owners of the properties. I know of twelve cases of typhoid fever caused from drinking water from a certain well. Investigation showed that at least six sink spouts and as many privies drained into a basin nearly surrounded by rock, in the centre of which the well was located.

We have caused certain old buildings to be torn down and removed, believing them to be dangerous to the public health; we have done, in fact, all that public sentiment would warrant us in doing.—Dr. A. W. Rowe, H. O.

1893. About $6,000.00 have been expended on the sewers. Twenty-five nuisances were reported to the board, of which twenty-three were removed. No cases of contagious diseases reported to the board.—Andrew J. Sampson, Sec.

Orient.

1892. Scarlet fever, two cases, but no other contagious diseases.

1893. We have had no cases of infectious disease.—Daniel Maxwell, Sec.

Orland.

1892. One nuisance removed. Diphtheria, one case; scarlet fever, three.

1893. Scarlet fever, three cases; typhoid fever, one.—R. P. Harriman, Sec.

Orono.

1892. Four nuisances were removed by the board. There were nine cases of typhoid fever.

1893. Twelve nuisances, that were reported to the board, were all removed with the exception of one. Diphtheria, one case; scarlet fever, one; typhoid fever, eleven. Our physicians neglect to report cases. It is probable that some of our cases of typhoid came from an old well, not used now, in the vicinity of the dumping ground.—U. C. Taylor, Sec.

Orneville.

1893. No infectious diseases reported.—Fred A. Hoxie, Sec.

ORRINGTON.

1892. Scarlet fever, six cases; typhoid fever, three. I have gone to the schools and looked after the cases to see that precautionary measures were taken. Scarlet fever was in a mild type. One school was closed two weeks on account of scarlatina, which, however, did not spread.

1893. One nuisance removed. Scarlet fever, twelve cases; typhoid fever, five.—Dr. G. B. Tibbetts, Sec.

OTIS.

1892. One nuisance removed, but no contagious diseases.

1893. There have been no contagious diseases in town and but one death, that from consumption.—J. R. Grant, Sec.

OTISFIELD.

1892. One nuisance removed. We had two cases of scarlet fever.—F. J. Sawyer, Sec.

1893. No contagious diseases this year.—E. B. Jillson, Sec.

OXFORD.

1892. Of three nuisances, two were abated. There is a block in town, owned by a manufacturing company, which contains ten tenements. The vaults connected with these tenements are bad, and, in fact, the sanitary condition of the whole thing is bad. Complaints are made to the board every year, but the company pays but little attention to our notices. Of infectious diseases, one case of diphtheria and one of typhoid. In cases of infectious diseases we require complete isolation, allowing no one to enter nor to leave excepting those really needed to attend the sick, and a thorough cleaning up follows, in accordance with your directions. Last spring measles prevailed to quite an extent.—S. D. Edwards, Sec.

1893. One nuisance removed. Three cases of typhoid fever.—Dr. William B. Haskell, Sec.

PALMYRA.

1892. One mild case of typhoid fever. The town has been in a very healthy condition. Three cases of tuberculosis in cattle.

1893. Scarlet fever, three cases; typhoid fever, one. Isolation and other precautions have been seen to, and no disease of any kind has been very prevalent.—G. W. Hanson, Sec.

Paris.

1892. One nuisance removed. Scarlet fever, four cases; typhoid fever, four. In connection with infectious cases, the health officer has at once looked into the matter and furnished blanks, circulars, etc., and given rules to be observed by the family physician.

1893. Four nuisances removed. Scarlet fever, twenty cases; typhoid fever, nine. Whooping cough was prevalent.—Dr. F. H. Packard, H. O.

Parkman.

1892. One or two cases were reported to be scarlet fever, but on consultation with the attending physician they appeared to be false reports.—H. O. Ayer, Sec.

1893. No contagious diseases.—S. A. Buzzell, Sec.

Parsonsfield.

1892. Three nuisances removed. Three cases of diphtheria. Houses were placarded.

1893. No contagious diseases reported, save one case of scarlet fever.—John P. Burbank, Sec.

Passadumkeag.

1892. Two cases of scarlet fever.

1893. One case of scarlet fever. Infectious diseases are always looked after. Measles, pneumonia, and diarrhœal diseases were unusually prevalent.—Dr. E. H. Stanhope, H. O.

Patten.

1892. Scarlet fever, three cases; typhoid fever, three. The necessary precautions were taken.—Dr. W. T. Merrill, Sec.

Pembroke.

1892. Sixteen cases of scarlet fever, but no deaths.—Dr. J. C. Rogers, Sec.

1893. Five cases of typhoid fever.—William Welch, Sec.

Penobscot.

1892. Two nuisances abated. Scarlet fever, six cases; typhoid fever, four. In each case the board has acted promptly in accordance with the instructions of the State Board. Whooping cough has been very prevalent. The best method of improving the sanitary condition of our people would be their education upon what constitutes some sanitary conditions of their surroundings. A few cases of poisoning from eating cheese, but none fatal.

We believe whooping cough should be classed with the other contagious diseases, and the same precautions taken to prevent its spreading.

In the centre of the town there is quite a settlement located upon land nearly flat, and with a subsoil of brick clay which is impervious to water. There is no system of drainage other than open ditches in which grass grows in the summer. In hot weather, after rains, offensive smells arise from the stagnant water. The drainage of this tract is needed.

1893. Scarlet fever, four cases; typhoid fever, one. These cases have been promptly taken in hand. Whooping cough was very prevalent early in the year. Some cases of measles occurred in connection with the schools; the children were taken from the schools when it was known they had been exposed to measles, and the disease was prevented from spreading.

In no case within the last three years, has scarlet fever been carried from one house to another within our jurisdiction.

Our local board is of the opinion that much expensive litigation is saved to the people by the work of local boards, as they in many cases act as boards of arbitrators and settle many cases between citizens that would otherwise be carried into the courts.—J. H. Littlefield, Sec.

Perham Plantation.

1893. There were no contagious diseases. Faulty sink drains make some places unhealthy.—C. I. Spaulding, Sec.

Perkins.

1892. No contagious diseases.—W. F. Reed, Sec.

1893. No contagious diseases.—Charles W. White, Sec.

Perkins Plantation.

1893. We have been free from contagious diseases this year.—George E. Newell, Sec.

Perry.

1892. No contagious diseases reported.

1893. Measles was present and a few cases of whooping cough last spring.—Jacob W. Pottle, Sec.

Peru.

1892. Scarlet fever, one case; typhoid fever, four.—A. B. Walker, Sec.

1893. Four nuisances were removed. We have enforced proper care of the privy vaults, and required the disinfecting and burying of excreta of those sick with typhoid fever. It has required quite a persistent effort to get some of the boarding houses near Rumford Falls cleaned up, but we persisted and we succeeded. Where typhoid fever occurred we have been particularly strict in regard to cleanliness.

Diphtheria, one case; typhoid fever, eighteen. The premises have been visited and examined thoroughly, and filthy places have been cleaned up, circulars have been distributed, disinfectants furnished, and the aid of the attending physician solicited. Measles was prevalent in the first part of the year.

In our work we have had the encouragement of the town officers and many of our citizens to do our full duty. In cases of nuisances we have quietly notified the parties by letter, and endeavored to avoid creating hard feelings or resentment.—Mandeville Hall, Sec.

Phillips.

1892. Scarlet fever, five cases; typhoid fever, two. Measles was prevalent.—B. Emery Pratt, Esq., Sec.

Phippsburg.

1892. No contagious diseases reported.—C. V. Minott, Jr., Sec.

1893. Contagious disease have been absent this year.—Dr. M. H. Ferguson, H. O.

Pittsfield.

1892. Six nuisances were removed by the board. Diphtheria, six cases; scarlet fever, one; typhoid fever, three. Prompt action has been taken to prevent communication with infected buildings and persons. On account of diphtheria the school was closed. It has been a year of unusual good health.

1893. Of seven nuisances reported, all were removed. All the diseases we have had have been six cases of typhoid fever. Water supply and sewerage are needed.—Dr. T. M. Griffin, H. O.

Plymouth.

1892. Four cases of typhoid fever occurred.—John F. Longley, Sec.

1893. We have had one case of typhoid fever, contracted in Augusta. One well in this village, the water of which we think caused four cases of typhoid fever last year, was found to be in close proximity to the sink drain and out-houses. These surroundings have been removed. One child was burned to death by its clothes catching fire at a stove.—Dr. A. W. Sylvester, H. O.

Poland.

1892. Four nuisances were removed. We had four cases of diphtheria and six of typhoid fever. The health officer visited the houses and directed what precautions should be observed. A few houses are built on damp land difficult to drain, consequently the cellars are wet.—Dr. E. F. Bradford, H. O.

1893. Scarlet fever, two cases; typhoid fever, four. The secretary has promptly visited infected places and taken all necessary precautionary means to prevent the spread of the disease. The cases of scarlet fever have been unusually mild.

An old barn, used as a slaughter-house, stands three or four rods from the street, directly opposite my residence. The stench from this causes us to keep our front door and windows closed many evenings in hot weather.—Dr. Jason Walker, H. O.

Porter.

1893. Three nuisances were removed by the board. One case of diphtheria. No cases of scarlet fever or typhoid were reported.

The case of diphtheria was looked after strictly as the law prescribes.—Dr. E. R. Chellis, M. O.

Portland.

1893. We had one case of small-pox, twenty-four of diphtheria, one hundred fifty-nine of scarlet fever, and one hundred eleven of typhoid fever. Patients are isolated and circulars left.—Edwin L. Dyer, Sec.

Pownal.

1892. Diphtheria, one case; scarlet fever, nine. The directions given by the State Board of Health were followed as best we could. There were some cases of cerebro-spinal meningitis.

1893. One case each of diphtheria, scarlet fever and typhoid fever. Pneumonia and the diarrhœal diseases of children were unusually prevalent.—Dr. S. A. Vosmus, Sec.

Prentiss.

1893. We have had one case of diphtheria.—T. N. Butterfield, Sec.

Presque Isle.

1892. Two nuisances were removed. Scarlet fever, six cases; typhoid fever, eighteen. Infected houses were closed. The sanitary condition of the town would be improved by doing away with privy vaults and cesspools. Drainage is needed.

1893. Scarlet fever, three cases; typhoid fever, thirty-seven.—Dr. Frank Kilburn, Sec.

Princeton.

1892. One nuisance was removed. We had one case of typhoid fever.

1893. Quite extensive repairs have been done on drains and some new ones have been made. Four nuisances have been removed. Scarlet fever, three cases; typhoid fever, three. Prompt action is always taken to check outbreaks of infectious diseases. We have had considerable whooping cough among the children.—Dr. S. G. Spooner, Sec.

Randolph.

1892. Three nuisances were abated. Diphtheria, three cases; scarlet fever, five; typhoid fever, four. Infected houses have been

placarded, the families have been isolated and carefully watched, the schools notified, etc. Sewers are needed very much. A brook into which many privy vaults empty renders some parts of the village unhealthy.

1893. Two nuisances were removed. We had four cases of scarlet fever, and five of typhoid fever. We still need sewerage.—Barrett A. Cox, Sec.

Rangeley.

1892. We have had twelve cases of scarlet fever, eight of which were very mild; and one case of diphtheria. Placards have been posted on the doors of infected houses and the cases have been looked after the best we could.—Dr. S. A. Ross, Sec.

1893. Scarlet fever, four cases; typhoid fever, one. Infected families have been isolated until the doctor ordered the houses disinfected.—Lyman Kimpton, Sec.

Raymond.

1892. Diphtheria, four cases; typhoid fever, one. Infected houses have been immediately quarantined and subsequently cleansed. Measles has prevailed. The carrying of the sink drains farther from the dwellings would improve the sanitary condition of many homes.—Alfred Wilson, Sec.

1893. The domestic water supply is in many cases brought through white iron pipes from springs that are higher than the buildings. We have had three cases of diphtheria, and four of typhoid fever. We have immediately taken measures to prevent the spread of the disease. Measles and whooping cough have been unusually prevalent. All the typhoid fever patients originated out of town.

There are a few more dwellings which need looking after. The members of one family are nearly all sick. The doctors have not yet named the disease, but some of the family have been sick for more than three years. They were formerly considered the healthiest family in town. Their sink drainage discharges very near the well.—Hiram M. Cash, Chr.

Readfield.

1892. We have had three cases of scarlet fever. The patients were isolated.—Dr. I. P. Park, Sec.

1893. Diphtheria, one case; scarlet fever, four. The required action was taken in these cases. Whooping cough was prevalent. —Dr. W. A. Wright, H. O.

Richmond.

1892. The sewers have been improved in some respects, but more work in that direction is needed. We have had eight cases of diphtheria, and three of scarlet fever. Strict attention has been given to these cases, families have been isolated as far as possible, the discharges from the patients have been buried, and disinfection cared for. Pneumonia, tonsilitis and the diarrhœal diseases of both children and adults have been unusually prevalent. Our water supply being good and ample we need an adequate system of sewerage and drainage to go with it.

1893. One case of alleged nuisance was investigated by the full board, but it was found to be not a nuisance in fact. We had sixteen cases of scarlet fever. The usual and specified measures have been made use of to prevent the spread of infection.

While perhaps there has been no other work of sufficient interest to merit special mention, it gives me pleasure to report that the formal meetings of the board, together with the quite frequent informal interviews, helped in no small degree to prompt and efficient work of the board at such times as the health and safety of the community demanded action.—Dr. D. S. Richards, Sec.

Ripley.

1892. Two nuisances were removed. We have had three cases of diphtheria, in connection with which every precaution was taken to prevent the spread of the disease. Whooping cough has been quite prevalent. We have distributed the circulars on diphtheria and other contagious diseases, and hope that our people will see the importance of assisting the board of health by keeping their premises in a good sanitary condition.

1893. Three nuisances were removed. There have been several cases of measles, but no other infectious diseases have been reported.—A. G. Farrar, Sec.

ROBBINSTON.

1892. We have had two cases of typhoid fever. In the district where the cases of typhoid fever were, is where we had so much trouble last year with diphtheria and it was in the same house.

1893. One nuisance was removed. We have had two cases of typhoid fever. Mumps has been unusually prevalent.—Frank R. Leach, Sec.

ROCKLAND.

1892. The board held thirty-one meetings during the year. Considerable addition has been made to the quantity of water supply by tapping other lakes, and our sewer system has been extended. A very general improvement in the clearing up of alleys, yards, cellars, etc., has taken place, and there is much more care in the disposal of excreta, rubbish, etc.

One hundred and thirteen nuisances have been reported to the board, all of which were removed. One case, which from its accumulated filth and the character of its inmates, had long been a menace to the health, as well as an eyesore to the residents of the vicinity, was finally referred to the board by the city authorities, with full power to act. The aid of the police was required to gain admission to the house, which was then thoroughly cleansed by agency of fire and water; the latter being plentifully supplied both outside and in from the street hydrant, after the consumption of the accumulation of years of rubbish and worse by the former. The surrounding land was then thoroughly broken up and turned under with a plow, and washed well with the hydrant hose. The former inmates were sent to institutions better adapted to their respective conditions, viz: the Insane Asylum and Industrial School.

Another case of some interest was that of a house, occupied as a boarding-house, in which a case of inflammation of the throat first appeared, but upon which diphtheria was grafted by the unsanitary condition of the premises. From this case undoubtedly originated all the other cases of the disease occurring in the city, and we believe it to have been carried beyond the city limits through the violation of orders not to leave the house, by one of the boarders; for which he was subsequently arrested and fined; the house, meanwhile, being placed under police surveillance.

We have had ten cases of diphtheria; three of scarlet fever and six of typhoid fever. The usual legal requirements have been observed in these cases, to wit, isolation, placarding, and the final disinfection of the premises. Measles was quite prevalent.—Dr. F. E. Hitchcock, H. O.

1893. One hundred seven nuisances, reported to the board, were all removed. We have had two cases of diphtheria, four of scarlet fever, and seven of typhoid fever. Whooping cough has been slightly more prevalent than usual.—Dr. W. V. Hanscom, H. O.

ORDERS OF THE BOARD OF HEALTH OF THE CITY OF ROCKLAND, MAINE.

1. On and after the first day of July, A. D. 1887, no person shall be allowed to construct any privy vault, cess-pool or any other receptacle or conductor for draining for filth, of any kind in any locality, within the city limits, where access can be had for drainage to a public sewer. When, upon proper complaint made in writing to the Board of Health, any privy vault, cess-pool, receptacle or conductor, constructed and maintained prior to the adoption of these orders, shall after careful and thorough investigation, be adjudged by the Board of Health to constitute a nuisance, or a source of danger to the public health, such privy vault, cess-pool, receptacle or conductor shall forthwith, be discontinued and abolished, when the premises upon which said nuisance exists can be connected with the public sewer. When such nuisance exists in localities unprovided with proper street sewers, such disposition shall be made of them as the board of health may determine.

2. Whenever any reasonable complaint is made regarding the keeping of any swine within the city limits, the inspector shall order the swine to be removed.

3. Any accumulation of refuse matter such as swill, waste of meat, fish or shells, bones, decayed vegetables, dead carcasses, excrement, or any kind of offal, which may decompose and generate disease germs, or unhealthy gases, and thus affect the purity of the air in the immediate vicinity of any dwelling house or place of business shall be considered a nuisance and must be removed or disposed of either by burial, burning, or otherwise, and in such manner that it may not be offensive to the neighborhood, wherever located.

4. No diseased animal or its flesh, and no decayed meat, fish, vegetables, or fruit, or impure or adulterated milk, nor any impure or adulterated food shall be sold or offered for sale as food.

5. No refuse matter, such as swill, waste meat, fish or shells, bones, decayed vegetables, dead carcasses, excrement, or any kind of offal which may decompose and generate disease germs or unhealthy gases, or obstruct the flow of water therein, shall be thrown or deposited in the city limits, in the "Lindsey Brook" or any of its tributaries, under a penalty of ten dollars for each offense, to be recovered by complaint before the police court of the city of Rockland.

6. Any person having a wall or embankment of any kind on the margin of said brook or tributaries shall keep the same in such repair that it shall not obstruct the free flow of the water; and whenever any part of such wall or embankment shall fall or slide into the water the owner shall remove the same immediately, and if he unreasonably neglects to do so it shall be removed by the city at the expense of the owner.

All shops, stores or buildings used, occupied or let for the purpose of manufacture or trade, shall be furnished with suitable and sufficient water closets and urinals, which in respect to their construction and supply of water shall be satisfactory to the board of health; and any person or persons who shall use, occupy or let any building or tenement in which trade or manufactures are carried on, and shall not furnish the same with suitable and sufficient water closets and urinals satisfactory to the board of health, shall be subject to a penalty of five dollars for each offence, and five dollars additional for each month that the offence shall be allowed to continue.

Whenever a privy vault shall have been removed by order of the board of health, or otherwise, the premises shall be supplied with a suitable water closet, which, in respect to its water flush, shall be satisfactory to the board of health.

Rockport.

1892. Seven nuisances were removed. We had twenty-five cases of scarlet fever and six of typhoid fever. Cases of contagious diseases were placarded and quarantined at once. A case of diphtheria, of typhoid fever, and of cerebro-spinal meningitis

occurred in a house where the sink spout flowed into the privy vault, the drain pipe from which had become clogged. The privy opened into a room adjoining the kitchen.

At a meeting of the board in September it was voted to quarantine all vessels arriving from foreign ports and not having a clean bill of health, until they were inspected by the health officer. Several vessels were inspected and passed.

A very nice sewer has been built from the new $10,000 school-house, just finished, to tide water, passing several residences which may avail themselves of this opportunity for drainage. The new school-house is heated by steam, is large and airy, and contains five school rooms, teachers' rooms, class rooms, library, laboratory, etc., and all the modern improvements.

1893. Three nuisances were abated. We had one case of scarlet fever.—Dr. H. E. Abbott, H. O.

Rome.

1892. We had one case of diphtheria and two of scarlet fever. In cases of this kind the co-operation of the attending physician in arresting the spread of the disease is secured.

1893. We had three cases of typhoid fever.—L. G. Martin, Sec.

Roque Bluff.

1892. We have had no cases of infectious disease the past year, to our knowledge.

1893. We have had no cases of contagious disease this year excepting measles.—Gilman Stearns, Sec.

Roxbury.

1892. We have had no cases of contagious disease this year.

1893. No contagious diseases this year, save measles.—A. W. Robbins, Sec.

Rumford.

1892. Two nuisances were removed. Diphtheria, four cases; typhoid fever, two.—Dr. J. W. Stuart, Sec.

1893. Drains have been laid in most of the principal streets. A large number of nuisances have been reported, all of which have been removed. Eighty notices have been sent out ordering prem-

ises to be put in sanitary condition. We had one case of scarlet fever and six of typhoid fever. In nearly every case of typhoid fever accumulations of filth were found on the premises; in one fatal case the cellar was used as a cess-pool, and in another case there was an open sewer pipe in the cellar.—Charles N. Waite, Sec.

From the By-Laws of the Rumford Board of Health.

1. The board of health will receive and examine into all complaints made by the citizens of the town, concerning nuisances dangerous to life and health within the town limits, and will enter any place or premises where such nuisances are known or believed to exist.

2. Whenever in the opinion of the board of health, the conditions of any house, building, or premises, are considered prejudicial to the public health, the secretary of the board of health will send notice in writing to the owner, agent, or occupant of such building or premises, requiring him to disinfect and cleanse such premises to the satisfaction of the board of health within a time specified in such notice.

If the person to whom notice is sent fails to comply therewith, he shall be liable to a penalty of not less than five dollars and not exceeding ten dollars for each day during which he continues to make default, and the board will order the premises vacated, and will cause them to be disinfected and cleansed at the expense of the town, and the town may recover the expenses so incurred from the owner, agent, or occupant, as provided by statute.

3. No person shall throw or cause to be thrown, any garbage, house refuse, or waste animal or vegetable matter, or dirty water or filth of any kind in any street, lane, alley, vacant lot or canal.

If any of the substances mentioned above shall be thrown or carried into any street, lane, alley, vacant lot or canal, from any house, shop, cellar, yard, or any other place, the owner or occupant of such place or house and the person who actually threw or carried the same therefrom, shall severally be held liable for such violation of this by-law.

The secretary of the board of health will send a written notice to such offender, ordering the removal of the before-mentioned substances within a specified time. If the person to whom notice is sent fails to comply therewith he shall be liable to the penalties,

and the board of health may act as for violation of section two of these by-laws, as provided by statute.

4. All garbage, house refuse or waste matter of any kind, shall be placed in convenient covered receptacles and shall be removed as often as deemed necessary by the board of health, at the expense of the owner or occupant.

5. No system of waste pipes or drains shall be placed in any house, shop or other buildings, until the same shall have been approved by the secretary of the board of health.

Saco.

1892. About 4,000 feet of sewers have been constructed. Sixteen nuisances were reported, fourteen of which were removed. The most trouble we have had has come from lack of proper drainage. We have had fifteen cases of scarlet fever, and nine of typhoid. Investigation is always made as to the source of contagion and the contagious cases quarantined. One death occurred from burns received by a mother in her efforts to save a child whose clothing caught fire from the breaking of a lighted kerosene lamp.—Dr. H. A. Weymouth, Sec.

1893. One section of the town has been relieved of a great nuisance by the extension of our sewers. The board has been insisting upon this for two years. Diphtheria, three cases; scarlet fever, forty; typhoid fever, four.—H. E. Tibbetts, Sec.

Salem.

1892. Measles and mumps were prevalent, but no other infectious diseases have been reported.—George E. Willis, Chr.

1893. We had one case of typhoid fever, and some of measles. —George W. Harris, Sec.

Sanford.

1892. The residents of two streets have put in a sewer. Nine nuisances were removed. Diphtheria, ten cases; scarlet fever, six; typhoid fever, ten. Infectious patients have been isolated and a rigid quarantine has been established. We had many cases of measles and German measles. In the spring an epidemic of erysipelas.

We have found that many of the tenements in our village have their sink spouts running direct into cess-pools, with the gases from

these cess-pools continually pouring into the houses. We have had all such sink drains trapped. Every case of nuisance was attended to when the owner's attention was called to the matter. As a rule, the citizens co-operate with the board in all sanitary measures suggested.

1893. One nuisance was abated. We had five cases of diphtheria, thirty-four of scarlet fever, and seventeen of typhoid fever. Many of the cases of scarlet fever probably originated in localities where the disease prevailed two years ago, and many of them did not report or call a physician.—George E. Allen, Sec.

Sangerville.

1892. Of seven nuisances reported to the board, all were removed. We had one case of typhoid fever. Whooping cough and the diarrhœal diseases of children were present. Sewerage and drainage are needed in some parts of the town.

1893. Four nuisances were removed. Five cases of scarlet fever, which were treated in accordance with the provisions of the law. By careful isolation the disease was not permitted to spread from the first house infected. Whooping cough prevailed. We had one fatal case of cerebro-spinal meningitis.—H. C. Ford, Sec.

Scarboro.

1892. Three nuisances were abated, all that were reported. We had one mild case of scarlet fever, and three cases of typhoid fever.—M. I. Milliken, Sec.

1893. Two nuisances were abated. Scarlet fever, one case; typhoid fever, two. There were some cases of German measles.—B. Frank Seavey, Sec.

Searsmont.

1892. One nuisance was abated. We had two cases of diphtheria. The patients were isolated, the houses were placarded, and disinfection of the clothing and houses was done after recovery. A better water supply is needed.—A. G. Caswell, Sec.

1893. One nuisance was removed. No cases of infectious diseases.—Otis D. Wilson, Sec.

Searsport.

1892. One nuisance was abated. Five cases of scarlet fever and one of typhoid fever.

1893. This year we had eleven cases of scarlet fever and one of typhoid fever. The houses and families were promptly isolated and, later, disinfected.—Dr. E. H. Durgin, Sec.

Sebago.

1892. We have had no cases of contagious disease.—Joseph B. Brown, Sec.

1893. We have had six cases of diphtheria this year, and one of typhoid fever. The cases of diphtheria have been promptly isolated and disinfectants carefully used throughout the sickness, and after death or recovery all the houses were disinfected. When deaths occurred from diphtheria I superintended the burials. There were no public funerals. The pupils from infectious houses have been excluded from the schools. Two schools were stopped as also a singing school.—Abram J. Ward, Sec.

Sebec.

1893. We had one case of diphtheria and some measles.—Clarence Parker, Sec.

Seboeis Plantation.

1893. We had no infectious diseases.—W. O. Smart, Sec.

Sedgwick.

1892. One nuisance was removed. We had two cases of typhoid fever. One school was closed a few weeks on account of measles.

1893. One nuisance was abated. There were six cases of scarlet fever, and one of typhoid. The death of one old lady was caused by her clothes catching fire from a falling lighted candle.—M. L. Elwell, Sec.

Shapleigh.

1892. One nuisance was abated. Diphtheria, two cases; scarlet fever, three; typhoid fever, one. All precautions were taken in these cases. Measles prevailed in school by one infectious pupil's attendance.—Dr. E. L. Thompson, Sec.

1893. Two nuisances were abated. We had one case of diphtheria, four of scarlet fever and one of typhoid fever.—F. C. Staples, Sec.

Sherman.

1892. One nuisance was abated. We had thirty-four cases of scarlet fever and one of typhoid, but no deaths occurred from any of these cases. Immediate action has been taken when scarlet fever has occurred. The cases of scarlet fever were unusually mild.

There has been great improvement in the sanitary condition of the town since the establishment of the State Board of Health and the local board. The inhabitants appear to be more interested from year to year in public health work. It is very seldom we find obstinancy or a person who is indifferent to suggested methods for improving the healthfulness of places. The action of the board has generally been sustained by the people; if complaint is made by them it is that we do not take decided action in suspected cases the same as we do in the well defined cases.

1893. Three nuisances were abated. This year we have had only one case of diphtheria and three of scarlet fever. It is the purpose of the board to be prompt in acting on all reported cases and make thorough work with all contagious diseases, and we have been very successful in stopping the spread of such diseases.—Levi C. Caldwell, Sec.

Shirley.

1892. We have not had a case of diphtheria, scarlet fever or typhoid fever. It has been a year of unusual good health.

1893. No contagious diseases.—Henry Blackstone, Sec.

Sidney.

1892. We had thirteen cases of scarlet fever, and many cases of tonsilitis in the autumn.

1893. One nuisance was abated. We had six cases of scarlet fever, and one of typhoid. The family where the case of typhoid fever occurred, was drinking water from a spring on the muddy shore of the Kennebec river. The case came on when the water in the spring was low.—Dr. Daniel Driscoll, H. O.

Silver Ridge Plantation.

1893. The general health of the plantation has been good, with no prevailing diseases except measles.—Mrs. Emily L. Dow, Sec.

Skowhegan.

1892. Four nuisances were abated. We had five cases of scarlet fever, and two of typhoid fever. All real and suspected cases have been reported immediately to the health officer who promptly investigated all of them, required strict isolation, thorough disinfection, etc. Some unhealthy localities are the result of improper drainage or the lack of drainage. One of the cases of typhoid fever was apparently caused by a cess-pool under an out-building. Fever has occurred on the same premises for several years in succession. This nuisance, we hope, has now been removed as far as is possible without the necessary subsoil drainage.

On account of the severe injuries sustained by the health officer early in the year, which confined him to the house several months, but little "house to house inspection" was done during the past summer, but the thorough work done the year previous, and the interest created in an improved sanitary condition of the town have been felt throughout the past year. There has been a general improvement in the condition of the streets, gutters, sidewalks, etc. We have a good system of water works, but we need very much a sewerage system.

1893. Over $25,000 have been expended in the construction of sewers; about three miles of pipe have been laid and our needed system of sewerage is far advanced toward completion. All cases approximating a nuisance, which have been very few, have been removed. We had twenty cases of scarlet fever, mostly of a mild form, but no cases of diphtheria or typhoid fever.

Section 9 of the by-laws of the board of health of Skowhegan provides as follows:

"It shall be the duty of the health officer to make a tour of inspection annually, during the months of May and August, of all the streets, vacant lots and premises within the corporation, where filth and rubbish are allowed to accumulate, and shall exercise the power conferred upon the board of health, to order the suppression and removal of nuisances and conditions detrimental to life and health found to exist within the jurisdiction of this board."

The house to house inspections of the health officer, in accordance with the provisions of this section, who should take time to instruct the people *how* and *what* to do to improve their sanitary surroundings, will accomplish a great deal even in one season. I give notice, a week or two beforehand, through the local paper, that I shall soon start on my tour of inspection and shall expect to find everything in order. Even those who have been intolerably slack and filthy will learn to clean up their places and improve their sanitary surroundings.

When an interest has once been awakened in the community the work of the health officer will grow lighter and more pleasant.—Dr. J. N. Merrill, H. O.

Smithfield.

1892. We had one case of diphtheria, and one of typhoid fever.—Wm. J. Haynes, Sec.

1893. Only one case of scarlet fever this year.—Wm. J. Haynes, Chr.

Smyrna.

1893. We had one case of typhoid fever. The house was secured from visitors.—R. E. Timoney, Sec.

Solon.

1892. Two cases of scarlet fever. Public notices were given, isolation required, and the houses were disinfected after the disease had passed.

1893. We had one questionable case of scarlet fever, but, otherwise, no contagious diseases.—Dr. S. F. Greene, H. O.

Somerville.

1892. No contagious diseases this year.

1893. Another year has passed without contagious disease.—Morrill Glidden, Sec.

South Berwick.

1892. Complaints were made of twenty-two nuisances, all of which were removed. Diphtheria, one case; scarlet fever, one; typhoid fever, two. Every effort is made to prevent the spread of infectious diseases. We have had measles and whooping cough, but not of a severe type. Sewers are needed.

1893. Twenty-five nuisances were reported. We have had two cases of diphtheria, nineteen of scarlet fever, and one of typhoid fever.—George F. Clough, Sec.

Southport.

1893. Five cases of diphtheria, three of which were fatal, occurred in the early part of the year. There was no local board of health at the time. Since the appointment of the present board we have had no cases of contagious diseases.—W. N. Grover, Sec.

South Thomaston.

1892. There were eight cases of diphtheria and two of typhoid fever within the year. Infectious houses have been placed in strict quarantine and all sanitary precautions employed. Whooping cough was prevalent. Diphtheria having appeared in the schools they were promptly suspended and the school-house was fumigated before the school was reopened.

1893. Four cases of diphtheria and five of typhoid fever occurred. The cases of typhoid fever were apparently caused by a polluted well which was disinfected with lime.—Dr. George C. Horn, Sec.

Springfield.

1892. Diphtheria, two cases; typhoid fever, one. Measles, pneumonia, and the diarrhœal diseases of children were unusually prevalent.

1893. We had two cases of diphtheria and one of typhoid fever this year. Scarlet fever reported in the spring proved to be German measles, which was quite prevalent.—Dr. P. H. Jones, Sec.

Stacyville Plantation.

1893. We have had neither a case of diphtheria, scarlet fever, nor typhoid fever in town. In our sanitary work we see that all filth and uncleanliness are removed.—Silas R. Mitchell, Sec.

Standish.

1892. Diphtheria, one case; scarlet fever, one; typhoid fever, two.—M. S. Spear, Sec.

1893. We had five cases of scarlet fever, and eight of typhoid fever. Prompt quarantine was established, the usual methods of

disinfection were employed, and the families were supplied with appropriate literature treating of their particular malady, as supplied by the State Board of Health. Measles was prevalent. Typhoid poison could not be located; the cases were all scattered, each family having its water supply from its own well, but in some of these wells the water was low on account of the long continued drought.—Dr. C. L. Randall, Sec.

Starks.

1892. There has not been a case of infectious disease in town. —Thomas Buswell, Sec.

1893. This year we have had eleven cases of scarlet fever, with two deaths resulting. We took every lawful measure to prevent its spreading.—Cyrus M. Greenleaf, Sec.

Stetson.

1892. Three nuisances were removed. We have had five cases of scarlet fever.—Dr. I. W. Tibbetts, Sec.

1893. One nuisance was removed. With the exception of measles and whooping cough we have known of no cases of contagious diseases.—T. J. Cleveland, Sec.

Steuben.

1892. Two nuisances were removed. There were four cases of scarlet fever. In one district we closed the school and three houses were completely isolated for several weeks. In this district the outlook at one time was alarming, but energetic measures and good medical attendance prevented the disease from spreading.

The heating and ventilating of nearly all country school-houses is bad. Ours are as good as the average, but still it is cold feet and headache,—too hot overhead and too cold under foot.

1893. There were three cases of scarlet fever which were attended to at once.—B. W. Stevens, Sec.

St. Albans.

1892. We had two cases of typhoid fever. The action taken in connection with these cases is such as is prescribed by the State Board. Whooping cough caused one death in an infant.—Dr. C. A. Moulton, H. O.

1893. Two nuisances were abated. We had two cases of typhoid fever, and whooping cough was prevalent.—S. B. Prescott, Sec.

St. George.

1892. Two nuisances were taken care of. We had one case of diphtheria, four of scarlet fever, and six of typhoid fever. All necessary precautions were taken in these cases. Whooping cough has prevailed.

Nature has supplied our town with excellent drainage. The several villages are situated on gently sloping ground, and it requires but little effort to turn our drains into the ocean. We are also bountifully supplied with never failing springs of pure soft water. We are not troubled very much with typhoid fever and the kindred diseases.

1893. Two nuisances were abated. We had ten cases of scarlet fever and one of typhoid.

One death resulted from a burn with kerosene. A number of children were playing with cat-o'-nine-tails, dipping them into a dish containing kerosene oil. The oil caught fire, one of the little boys kicked over the dish, the oil coming into contact with the clothes of a child two years old, setting them on fire.—Dr. F. O. Bartlett, Sec.

St. John Plantation.

1893. Our town is in good condition. We have had no infectious diseases.—W. M. Cyr, Sec.

Stoneham.

1893. Diphtheria, two cases; scarlet fever, one. Infected houses have been placarded.—N. M. Russell, Sec.

Stow.

1892. We had no cases of diphtheria, scarlet fever, or typhoid fever.—Fred E. Guptill, Sec.

Strong.

1892. We had one case of scarlet fever and one doubtful case of typhoid fever. All the necessary precautions were taken. Measles was prevalent.

1893. We had two cases of scarlet fever, in connection with which prompt action was taken. Measles was unusually prevalent.—J. W. Porter, Sec.

Stockton Springs.

1892. One case of typhoid fever occurred, but otherwise no infections diseases. Typhoid fever is rare in this town; drainage is unusually good.—Dr. J. A. Pierce, Sec.

Sullivan.

1892. Two nuisances were abated. We had one case of typhoid fever. In October, November and December were numerous cases of fever of a bilious remittent type. Patients had vomiting of bilious matter, chills, constipation, remissions of twenty-four hours. The disease yielded to treatment with quinia and alkalies after about ten or twelve days duration. The cases were sporadic, with no discoverable cause.

1893. Two nuisances were abated. Scarlet fever, eight cases reported, and two cases of typhoid fever. Infected houses were placarded, patients were isolated, schools were closed, public meetings were prohibited, and infected houses were disinfected and cleansed.—Dr. F. W. Bridgham, H. O.

Summit Plantation.

1893. There have been no cases of contagious diseases.—Nelson Myrick, Sec.

Sumner.

1892. No contagious diseases occurred.—Sharon Robinson, Sec.

1893. There were two cases of typhoid fever. Better drainage is needed in some places.—Dr. C. M. Bisbee, H. O.

Surry.

1892. No contagious diseases were present.

1893. We had one case of scarlet fever, in which we acted promptly agreeably to the instructions of the State Board and the laws of the State.—Henry J. Milliken, Sec.

Swanville.

1892. One case of diphtheria. Whooping cough and measles were unusually prevalent. One child lost its life by its clothes catching from a wood fire.

1893. We have had no contagious diseases excepting chicken-pox which was unusually prevalent.—Z. L. Downs, Sec.

Swan's Island Plantation.

1893. We had no cases of contagious diseases save one of scarlet fever.—Dr. H. W. Small, H. O.

Sweden.

1892. During the whole year the town was very free from contagious and epidemic diseases.

1893. One case of typhoid fever occurred. A general enlightenment in regard to the sources of disease, contagion, etc., and the necessity of pure drinking water would help to improve the sanitary condition of the town.—N. O. McIntire, Sec.

Talmage.

1892. We had no cases of contagious diseases.—Frank R. Neal, Sec.

1893. There has not been a contagious disease in this town for several years, and every thing is in a healthy condition.—C. W. DeLong, Sec.

Temple.

1893. Two nuisances were abated. With the exception of measles there were no contagious diseases. There were many cases of measles, and two children died as the result.—S. A. Derby, Sec.

The Forks Plantation.

1893. We had two cases of scarlet fever, which were properly quarantined.—M. C. Kennedy, Sec.

Thomaston.

1892. Work has been begun on the construction of sewers. Several nuisances reported to the board were all removed. We had six cases of diphtheria, seventeen of scarlet fever, and five of

typhoid fever. The board has observed the strictest sanitary rules, and isolated all patients, and kept those exposed to infection from mingling with the public. No public funerals are held after death from diphtheria or scarlet fever.

1893. The sewerage system begun nearly two years ago has been extended to other parts of the town. Diphtheria, seven cases; scarlet fever, three; typhoid fever, five. On account of the presence of diphtheria the schools were closed for several weeks.—Dr. H. C. Levensaler, H. O.

Thorndike.

1892. One nuisance was abated. We had one case of diphtheria. Whooping cough was unusually prevalent.—Ross Higgins, Sec.

1893. Two nuisances were removed. We have had no cases of contagious diseases.—J. C. Whitney,

Topsfield.

1892. We had five cases of typhoid fever, but four of these were in the plantation of Codyville. Two cases of measles occurred, and one school was stopped for two weeks on that account.

1893. No cases of contagious diseases this year, yet the board stands ready for action.—O. H. Taylor, Sec.

Topsham.

1892. Two nuisances were abated. Diphtheria, one case; typhoid fever, three. We have tried to do everything promptly. Measles and whooping cough were quite prevalent last spring.

1893. Five nuisances were abated. We had two cases of diphtheria, three of scarlet fever and five of typhoid. The education of the people in sanitary science would improve the sanitary condition of the town.—Dr. H. O. Curtis, Sec.

Tremont.

1892. Three nuisances were removed, with none of unusual character or with trouble in abating. Diphtheria, one case; scarlet fever, seven. An immediate visit is made to cases of infectious diseases, they are strictly attended to, the dwellings placarded, and isolation is seen to.

As our town is a summer resort, we visit the hotels early in the season, and again after they receive their company, to see that they are in a good sanitary condition, and the board visits them frequently to see that they are kept so. Our people are anxious to assist our board in its duties.

1893. One nuisance was abated. We have had one case of diphtheria, and fourteen of scarlet fever, and measles was very prevalent early in the season. There are no localities known in our town with a tendency to unhealthfulness. A monthly visit has been made by one or more of the members of the board to all parts of our town to be sure that there were no matters needing correction. The last Saturday of every month through April to October, inclusive, the board meets to consider what may be done to improve our sanitary condition through the colder season.—Dr. W. A. Spear, Sec.

TRENTON.

1892. We have had none of the specified contagious diseases. —K. K. Thompson, Sec.

TRESCOTT.

1892. No cases of contagious diseases have been known. If any had occurred they would have been taken care of.

1893. We have had no contagious diseases this year with the exception of measles.—John Saunders, Sec.

TROY.

1892. One case of typhoid fever was present.

1893. No cases of infectious diseases save one of scarlet fever. —Dr. Mark T. Dodge, Sec.

TURNER.

1892. Much more attention is being paid to drainage and water supply than formerly. Two nuisances became known to our board, which were promptly removed. We had twelve cases of diphtheria and three of typhoid fever.

1893. Two nuisances were removed, and we had two cases of diphtheria.—Dr. Roscoe Smith, Sec.

UNION.

1892. There were one case of diphtheria, three of scarlet fever, and one of typhoid fever. Measures were taken to prevent their spreading.

1893. Diphtheria, four cases; scarlet fever, five; typhoid fever, four. One school was closed on account of scarlet fever. Dr. E. R. Daniels, Sec.

Unity.

1892. We have had no cases of contagious diseases excepting measles, and whooping cough was very prevalent.—Austin Thomas, Sec.

1893. We have had no cases of diphtheria, scarlet fever, or typhoid fever. In the village the water supply is very impure. An improvement would be made by bringing the water supply from a spring. The spring is very favorably situated for this purpose.—Dr. Homer F. Benson, H. O.

Upton.

1892. Of infectious diseases, only one case of typhoid fever occurred. Bilious fever was prevalent. The case of typhoid fever was supposed to have been caused by polluted water.—E. Abbott, Sec.

Vanceboro.

1892. Twenty-five complaints of nuisances were made. All of the conditions complained of were removed so far as needful. We had two cases of scarlet fever and four of typhoid. Those precautions which are required by law were employed. Improved drainage and sewerage are needed.—C. A. Sterling, Sec.

1893. This year there have been no cases of infectious diseases. It has been unusually healthy.—Charles P. Cobb, Sec.

Vassalboro.

1892. Eight nuisances were abated. Diphtheria, eight cases; typhoid fever, one. In connection with these cases the premises have been examined, the family quarantined, and everything done to prevent the disease from spreading. The principal work of the board during the year has been contending with diphtheria. Five children in one family died with this disease. The family were removed and the house was burned.

1893. Four nuisances were removed. We had one case of diphtheria, two of scarlet fever and two of typhoid fever.—Henry D. B. Ayer, Sec.

Veazie.

1893. One nuisance, of which complaint was made, was abated. Two cases of scarlet fever and three of typhoid fever occurred. The house in which scarlet fever occurred was placarded and the rules of the board of health were enforced.—Albert J. Spencer, Sec.

1893. Improvements have been made in drainage; one nuisance has been abated; six cases of typhoid fever; four cases of measles. —George W. Frost, Sec.

Verona.

1892. We had one case of typhoid fever.

1893. We have a very healthy town. One case of typhoid fever, contracted in Bangor, was all in the way of infectious diseases.—A. H. Whitmore, Sec.

Vienna.

1892. We have not had a case of diphtheria, scarlet fever or typhoid fever, but there were two fatal cases of cerebro-spinal meningitis.

1893. One nuisance was abated. Diphtheria, one case; typhoid fever, two.—Lendell C. Davis, Sec.

Vinalhaven.

1892. Some improvements have been made in the way of sewerage and the disinfection of excreta. Three nuisances have been abated. We had no cases of contagious diseases.

1893. There has been a gradual and general improvement in all directions. Eight nuisances have been abated. Scarlet fever, four cases; typhoid fever, two. The houses were closed to all except nurses. It is believed the two cases of typhoid fever were caused by polluted well water. The well has been abandoned and will be filled with stone.—Dr. E. H. Lyford, H. O.

Waite.

1893. No contagious diseases this year. We would suggest a more general use of earth closets as a means of improving the sanitary condition of the town.—J. C. Neale, Sec.

Wales.

1892. Two nuisances were removed. No cases of contagious diseases.

1893. Two nuisances were reported. One case of scarlet fever. The house was placarded and due care was taken.—Benjamin Hodsdon, Sec.

Waldo.

1892. We had one case of typhoid fever, and measles was prevalent. The case of typhoid fever was contracted in Belfast.

1893. No contagious diseases.—J. G. Harding, Sec.

Waldoboro.

1892. We had five cases of diphtheria, seven of scarlet fever, and one of typhoid fever. Strict quarantine was enforced in all cases of diphtheria and scarlet fever. Measles and whooping cough prevailed to quite an extent.

1893. The year has been a very healthy one. We have had but two cases of typhoid fever. Whooping cough was unusually prevalent.—Dr. F. M. Eveleth, Sec.

Waltham.

1892. One nuisance was abated. No cases of infectious diseases.

1893. Four cases of typhoid fever occurred. The sanitary condition of the town is well looked after.—Mrs. Hannah Fox, Sec.

Warren.

1892. We had one case of scarlet fever and three of typhoid fever. We take every precaution to prevent contagious diseases from spreading. Whooping cough was prevalent. Better water and better drainage in some places would work an improvement.

1893. We had three mild cases of typhoid fever. It has been unusually healthy the past year.—Dr. J. M. Wakefield, Sec.

Washburn.

1892. Two nuisances abated. Scarlet fever and typhoid fever were unusually prevalent; there were thirteen cases of the former

and twenty-two of the latter. Proper measures were taken to limit these diseases.

1893. Three nuiances were abated. We had six cases of scarlet fever, and two of typhoid. Bad drainage is accountable for some unhealthy localities.—Dr. H. S. Sleeper, H. O.

Washington.

1892. Two nuisances abated. Ten cases of scarlet fever. Whooping cough was prevalent and entered one of the schools, which was closed for a while.—T. S. Bowden, Sec.

1893. We had three cases of diphtheria, and one of scarlet fever.—J. F. Davis, Sec.

Waterborough.

1892. We had four cases of diphtheria, and measles was present.—Charles W. Patterson, Sec.

1893. We had four cases each of diphtheria, scarlet fever and typhoid fever. Precautions were taken. Measles and whooping cough prevailed.—George P. Chase, Sec.

Waterford.

1892. We had two cases of scarlet fever, but we were unable to discover the source of contagion. We had one case of cerebro-spinal meningitis, which proved fatal.

1893. Scarlet fever, five cases; typhoid fever, one. Placarding, quarantine and disinfection were used. One of the schools was suspended for a time on account of scarlet fever in a family whose children were pupils in this school. We had one quite interesting case of chronic lead poisoning caused by drinking water passing through lead pipe. The house had been vacant for a year or more and the water had been standing in the pipe. The patient was gaining at the last account.—Dr. F. S. Packard, Sec.

Waterville.

1892. Many nuisances have been abated during the year. Of diphtheria, we have had very few cases, of scarlet fever about thirty and of typhoid fever, eight or ten. The experience of our board has suggested that there should not be a hog kept in the city. I have done about all that has been done, and get the munificent sum

of $25.00 a year for it. The hunting up and burying of dead horses, pigs, hogs, etc., inspecting of privies and sink spouts, the miscellaneous and dirty work that should be done, is worth, at least, $150.00 a year. If I incur expense in having a nuisance removed the city will not pay me for it. I have resigned twice, but the city would not accept my resignation, but now I have declined to serve, dead sure.—C. H. Redington, Sec.

1893. One hundred or more nuisances have been abated. Trouble has frequently occurred on account of not having an ordinance compelling owners to connect with the sewer. Diphtheria, thirteen cases; scarlet fever, forty-six; typhoid fever, eleven. Immediately upon receiving notices of these cases the premises were placarded, disinfection was carried out, and much care was taken to keep the schools free from contagion. By the joint action of the superintendent and the teachers with the local board all the schools have run full time. With the salary this city is willing to pay I cannot suggest methods for improving the sanitary condition of the town.—W. B. Smith, Sec.

Wayne.

1893. There have been no cases of contagious diseases.—Dr. F. L. Chenery, H. O.

Webster.

1892. Three nuisances were abated. We had ten cases of scarlet fever. Strict precautions were taken to restrict this disease. Better drainage is needed in the village.

1893. Four nuisances were removed. Three cases of scarlet fever. Placarding and quarantining were used. Whooping cough was quite prevalent.—James G. Jordan, Sec.

Webster Plantation.

1893. No contagious diseases this year.—Charles D. Cole, Sec.

Weld.

1892. One nuisance was abated. We had two cases of typhoid fever. Measles and whooping cough were unusually prevalent.—Dr. C. E. Proctor, H. O.

1893. One case of scarlet fever was present and eight cases of typhoid fever. Instructions were given by the attending physician

for the prevention of the spread of contagion. Measles and cerebro-spinal meningitis were unusually prevalent, and the village school was closed on account of mumps. Three cases of typhoid fever in one house were thought to have been caused by cess-pool gas.—H. B. Austin, Sec.

Wellington.

1892. One nuisance was removed. We had one case of typhoid fever.—Franklin T. Fry, Sec.

1893. We have had one case of diphtheria and one of typhoid fever, and whooping cough was unusually prevalent.—John M. Small, Sec.

Wesley.

1892. No contagious diseases this year.

1893. No contagious diseases excepting whooping cough in one house. We required the sick ones to remain isolated so it did not spread. There were a few cases of measles, very mild.—Samuel Hawkins, Sec.

West Bath.

1892. No contagious diseases in town.—J. W. Winter, Sec.

Westbrook.

1892. Ten nuisances reported to the board were removed. Of contagious diseases we had twelve cases of diphtheria, twenty-three of scarlet fever, and five of typhoid fever. Infected families are visited at once, proper inquiries are made as to the cause of contagion, also in regard to children attending school, and circulars of the State Board are left. Eight of the cases of diphtheria occurred in Scotch families, in which contagion was transmitted by the intermingling of their children. Several cases of death, said to have been from acute tonsilitis, were reported from the same families where diphtheria was subsequently reported. Five houses infected stood together in a row; twenty-six children from these houses were excluded from school, and a thorough cleansing from cellar to garret was instituted before the children were allowed to return to school. In that way we stopped what threatened to become an epidemic.

1893. Several new sewers have been built, and new methods of cleaning vaults have been adopted. Nine nuisances have been

abated. Diphtheria, seven cases; scarlet fever, five; typhoid fever, ten. These were looked after strictly in accordance with the requirements of the law. For many years we have not had so small a number of contagious diseases as in the year past. In the year 1892 unusual efforts were made to cleanse infected localities.

This year the following order was adopted by the local board of health and approved by one of the judges of the Supreme Judicial Court.

Section 16. No person shall clean out any privy vault without first obtaining a permit in writing from the local board of health, and after the fifteenth day of August, 1893, the work of cleaning vaults must be done by what is known as the "Barrel Method," and some deodorizer which shall be approved by said board, must be used.—H. K. Griggs, Sec.

Westfield Plantation.

1893. We had four cases of typhoid fever, and measles prevailed to an unusual extent.—C. M. Tompkins, Sec.

West Forks Plantation.

1893. One nuisance was abated. There were two cases of scarlet fever.—Oliver C. Adams, Sec.

West Gardiner.

1892. There were two cases of diphtheria. The houses were placarded and all other measures were taken that were thought necessary to prevent the disease from spreading.

1893. One case of scarlet fever. We have had no epidemics of any kind.—William P. Haskell, Sec.

Westmanland Plantation.

1893. No contagious diseases.—John E. Petersen, Sec.

Weston.

1892. No contagious diseases.

1893. We have had no contagious diseases this year.—George W. Brannen, Sec.

Westport.

1892. No cases of infectious diseases have been reported—S. P. Webber, Sec.

Whitefield.

1892. For contagious diseases we had only three cases of measles, which were brought from another town and did not spread. During the winter of 1892-93 influenza was extremely prevalent; whole neighborhoods were prostrated at one time. In many instances known to the board persons from a distance visited their friends sick with this disease and were themselves stricken down with it, thus spreading the disease in their localities where it was not known before. From careful observation at the time the disease was prevalent, and the very many who were attacked with it after being exposed to the disease, the board generally is of the opinion that the influenza epidemic during the past year was contagious.

1893. Four cases of scarlet fever and three of typhoid fever, and whooping cough prevailed in a mild form.—George A. Moody, Sec.

Whiting.

1892. We have had no cases of diphtheria, scarlet fever, or typhoid fever. Mumps was prevalent.—Abijah M. Crane, Sec.

1893. No contagious diseases save measles and whooping cough.—Sewall T. Chase, Sec.

Whitneyville.

1892. We had this year three cases of diphtheria, twenty of scarlet fever in a mild form, and one of typhoid fever. The infected houses were placarded, notices were posted at the post office and other public places, and other precautions were taken as the law requires. We have placed in every house in this town Circular No. 50 and Form No. 47 and other circulars. We have done all in our power to educate our people on these subjects and our efforts have been quite successful.

1893. We have been entirely free from contagious diseases since our last annual report.—Charles H. Sullivan, Sec.

Willimantic.

1892. Fifteen rods of sewer pipe were laid at the spool mill works. One nuisance was removed. We have had no contagious diseases excepting six cases of measles.—Frank Hart, Sec.

1893. Two nuisances were abated. Drainage was opened for three cottages. No infectious diseases reported.—C. C. Norton, Sec.

Williamsburg.

1892. No cases of contagious diseases in town.

1893. Again this year no contagious diseases.—M. W. Kennison, Sec.

Wilton.

1892. There have been twelve cases of scarlet fever and two of typhoid fever. The requirements of the law were followed as closely as possible.

1893. Three nuisances were abated. We had three cases of scarlet fever and six of typhoid fever. The water supply, drainage, sewerage, and the disposal of excreta have been looked after. —Dr. A. B. Adams, Sec.

Windham.

1892. Scarlet fever entered one of the schools, but was confined to that district. There were fifteen cases but no deaths.

1893. One case of diphtheria was taken care of by the board. No other contagious diseases reported.—Dr. I. D. Harper, Sec.

Windsor.

1892. One nuisance was abated. One case of diphtheria. Immediate attention is always given to cases of this kind.

1893. There was one case of typhoid fever, and measles was confined to one family.—C. F. Donnell, Sec.

Winn.

1892. One nuisance was abated. No contagious diseases.

1893. Drains have been opened and good drainage secured. One nuisance has been reported, which, in the opinion of the board, has not been abated. It consists of open vats from a burned tannery. We have notified the owners to have them removed, but as yet it has not been done. We had three cases of typhoid fever. The circulars of the State Board of Health have been scattered all over the town, through the schools, etc.—M. F. Scott, Sec.

Winslow.

1892. One nuisance was abated. We had two cases of typhoid fever. The place has been visited and the householder cautioned as to the proper care to keep the disease from spreading.—A. E. Ellis, Chr.

1893. One nuisance was abated. Diphtheria, one case; scarlet fever, three; typhoid fever, one. Chicken-pox was unusually prevalent.—George W. Patterson, Sec.

Winterport.

1892. We had three cases of typhoid fever. Sanitary precautions, which consisted in posting notices, distributing circulars, an oversight of funerals, and disinfection, were taken. Glanders was found in two horses. The bodies of the horses were eaten by dogs, one of which contracted the disease and was killed. The horses were then ordered buried.—Dr. C. F. Atwood, Sec.

Winthrop.

1892. The past year has been an easy one for the board; only six nuisances reported, which were all removed, and no contagious diseases.

1893. Ten nuisances were abated. For infectious diseases we had one case of diphtheria and one of typhoid fever, and measles was quite prevalent in the earlier part of the year.—Dr. C. A. Cochran, H. O.

Wiscasset.

1892. One nuisance abated. Two cases of diphtheria.—Dr. C. H. Leverton, H. O.

1893. No cases of diphtheria, scarlet fever, or typhoid fever reported, but measles and whooping cough have prevailed.—Dr. C. A. Peaslee, H. O.

Woodland.

1892. No contagious diseases.

1893. Five cases of scarlet fever. They were properly investigated and precautions taken. There was one fatal case of cerebro-spinal meningitis.—D. A. Snowman, Sec.

Woodstock.

1892. One nuisance was abated. One case of typhoid fever.—Dr. C. B. Rankin, Sec.

Woodville Plantation.

1893. No infectious diseases excepting one case of typhoid fever.—E. H. Smith, Sec.

Woolwich.

1893. Diphtheria, one case; typhoid fever, four, in a mild form.—Alton B. Thwing, Sec.

Yarmouth.

1892. Two nuisances were abated. We had two cases of diphtheria and five of typhoid fever. I have attended to all these cases personally and carried out the instructions of the State Board. Whooping cough was unusually prevalent.

1893. Five nuisances were reported, all of which were removed to the satisfaction of the board. Diphtheria, five cases; scarlet fever, eleven; typhoid fever, three. The printed instructions of the State Board of Health have been carried out to the letter. Water supply and sewerage are needed for the improvement of the sanitary condition of the town, and this subject is now being agitated by our best citizens and I think will come about in the near future.—Richard Harding, Sec.

York.

1892. Two nuisances were abated. We have had no cases of contagious diseases. The town is looking for a system of water supply; a charter has been granted the Water Company, and they promise to introduce the water system the coming summer.—Dr. W. L. Hawkes, Sec.

Influence of Inebriety on Public Health.*

By T. D. CROTHERS, M. D., Superintendent Walnut Lodge Hospital, Etc., Hartford, Conn.

All growth, development, and civilization begin and end in the individual. Train and develop the citizen, and both the community and nation are raised. Sanitary science is founded on this principle. Any evils which increase the number of diseased and defective persons bring additional obstacles to life and peril to all law and order. Defective and diseased persons always impede the army of advance. The laws of evolution teach the survival of the fittest; also the stern process of elimination, with its crushing out and crowding out. The unfit and defective must go to the rear; they have no right or place on the active field of conflict.

Inebriety is clearly more prominent as a cause of disease and degeneration than any other factors known at present. The various authorities who have tried to tabulate the number of defectives due directly and indirectly to inebriety have varied widely in their estimates, showing that the facts are not yet all grouped and studied. These estimates have placed inebriety as the active cause of from ten to sixty per cent. of all insanity; from thirty to eighty per cent. of all pauperism; from sixty to ninety per cent. of all criminality; and from thirty to seventy per cent. of all idiocy. These are the highest and lowest estimates made by various authorities in this country and Europe, and bring unmistakable evidence of the influence of inebriety, not only over public health, but over all growth and civilization.

The mortality from this source is equally startling, no matter what the exact figures may be. Inquiry and observation in every community will bring ample confirmation of the magnitude of inebriety in disease and degeneration. Some of the relations of inebriety to public health will illustrate the extent of its influence.

* Read at the twenty-first annual meeting of the American Public Health Association.

It is a remarkable fact that public sentiment concerning inebriety and the drink problem is far beyond all medical and scientific interest in this subject.

A political party with the central object of obtaining power to control and thus break up this evil, received two hundred and seventy-nine thousand votes last year. A large number of organized societies, composed of thousands of earnest men and women, are working for the same purpose. A host of revival orators are penetrating into every town of the country, holding meetings, and rousing up public sentiment to antagonize the drink evils. The churches are in this field with organized societies, urging moral means and remedies for this disorder. Over eighty journals and magazines are issued regularly from the press, devoted to this one cause. Hundreds of volumes and pamphlets are coming yearly from all parts of the country, and this literature is constantly growing more voluminous and aggressive. A feeling of alarm, with increasing efforts to find some means to check and neutralize this evil, is apparent everywhere.

On the medical and scientific side of this topic a half a dozen volumes have been written, a single journal devoted to this study is issued, and less than a hundred physicians have given any attention, or become prominent as students or writers in this field.

In all the great scientific questions of the times public sentiment follows timidly the lead of science. Here public opinion is leading, and is growing more agitated and earnest to find relief, while medical science has so far failed to either direct or point out the lines of march.

If we ascend above the agitation and conflict of theories, we are startled to find this great "drink army" to be the product of distinct causes and physical conditions,—to be born, bred, grown, and developed in soils and environments that we can realize and control.

The recruiting grounds, the sources and springs from which the inebriate comes, the direction of his march, destination, and end, and forces accelerating or retarding this movement, are clearly apparent to scientific inquiry. We are still more startled to find that this army of inebriates is increased and becomes more incurable by the blundering theories of public opinion, which seek by law, pledge, and prayer to halt and drive them back to sobriety and health.

Some idea may be formed of the influence of inebriety on the health of the public, from this fact: In 1891, eight hundred thousand persons were arrested, charged with intoxication and crime following. At least half a million more are known to be using spirits and drugs to excess. This practically represents a vast army of non-producers, who are centers of the most unsanitary conditions of life and living.

Also, an army that is "switched off the main line" of evolutionary growth and development, who are becoming more unfit, more degenerate, forming centers of pauperism, criminality, insanity, and progressive degeneration, not only being eliminated and crowded out, but concentrating a tide of evil that is transmitted to the next generation. A point of view a little higher up reveals this drink army as a great retrograde movement of individuals whose brain structure is breaking down, beginning at the highest levels and following a uniform line of march beyond the uncertainties of human will and the feebleness of personal effort.

The possibility of scientific interference, of limitation and prevention, increases with every advance of our knowledge of the causes. Already there is unmistakable evidence that inebriety can be checked and its evils removed, but only by the means of physical laws whose operations are above caprice. The same problem confronts us, as in other great remedial epidemics. Remove the causes and conditions which favor the growth and development of the disease, and place the victim in the best condition for returning health. Over a million recognized and unrecognized inebriates are scattered over all parts of the country, each one of whom is a center of degeneration, disease, and unhealthy sanitary life and living. Each one will transmit to the next generation a legacy of disease, lessened vigor, and imperfect development, crippling the generation to follow, with defects and limitations that cannot be described.

The delusion of free will to do otherwise is the fatal error which permits this army of inebriates to continue, year after year, not only destroying themselves and families, but to build up veritable centers of physical and mental ruin. Our indifference and criminal neglect of these classes result in literal breeding-places for a perpetuation and increase of all the evils and losses which follow from inebriety.

Sanitary science teaches clearly that no one has a right to destroy himself and peril the health and comfort of others. The inebriate is always a source of danger, and to permit him to become a criminal and pauper, before any legal remedy is applied, is a fatal error. The inebriate is a criminal pauper and madman, whose conduct forfeits all right to personal liberty, and who is practically an outlaw to his own and all other interests. The only remedy is legal control and quarantining in hospitals; not as criminals, but as diseased and helpless, the same as in cases of yellow-fever, small-pox, typhus, and other contagious diseases. The inebriate is a border-land maniac, and needs control, isolation, and treatment in special surroundings and in special conditions. Saloons and places for the free sale of spirits are breeding-centers of inebriety in every community. The sanitary perils which follow these places, and the physical and mental health of all its patrons, are not only destroyed, but the worst sanitary conditions are encouraged and grow up about these places. The saloon has no claim for recognition as a business. It is simply a parasite thriving on the decay and degeneration of the community. It is only tolerated by the densest ignorance and selfishness of its defenders. Saloons should be literally classed with foul sewers, dangerous waters, and the worst unsanitary death-dealing agents. Persecution as a moral evil only, keeps it alive, but any study from a scientific point of view would be fatal to its perpetuity.

Unregulated marriages are another unrecognized great breeding-center for the growth of inebriety. To-day inebriates, insane and neurotics of all stages, also criminals, are permitted to propagate and transmit their defects to the next generation. The result is a race of defectives who develop, under any or all circumstances, inebriety and all its associated degenerations. Thus, the inebriate pauper, criminal, and insane, are born and bred with absolute certainty. All authorities agree that from sixty to eighty per cent. of all inebriates who come for treatment in asylums are so by inheritance. Every community furnishes illustrations of this fact. This alcoholic stream, with all its criminal paupers and insane, is permitted to flow down through every community, and the inmates of every hospital and the victims of every police court are living witnesses of this stupid blunder.

Another recruiting-place for inebriety is the station-house and jail, and the legal treatment by fines and imprisonment. Of the

eight hundred thousand persons who were arrested for inebriety, less than one-tenth of one per cent. received any benefit. They were all made worse, and transformed into armies of inebriates who never desert nor leave the ranks.

Physically, the short imprisonment of the inebriate simply removes him from spirits and leaves him less capable of leading a temperate life.

Mentally, he has lost a certain self-respect and pride of character essential to recovery.

The first legal punishment of inebriates is followed by a species of fatality, seen in a constant repetition of the same or allied offences.

This fact is so apparent that these cases are called "repeaters" in the courts, and the number of sentences to the same person often extends to hundreds.

In one thousand cases confined at Blackwell's Island, New York, 935 had been sentenced for the same offence, drunkenness, from one to twenty-eight times.

The first sentence was a regular switch-point, from which the victim was precipitated to a constantly descending grade, becoming more and more incapacitated for temperate living.

The system of fines is equally ruinous, because it falls most heavily on the families, making it more difficult to support themselves, thereby increasing the perils of pauperism, both to the victim and those who depend on him for support.

It may be said, and the statement is sustained by many facts, that the legal treatment by the lower courts of cases of inebriety is fully as fatal as the saloons themselves where spirits are sold.

The saloon and the police court are literally the school and college for the training and graduation of classes of incurable inebriates that peril every sanitary interest in the country.

The fault is not in the courts and their administration of the law, but in the laws themselves, and in that state of public opinion which urges that all inebriates should be treated as willful criminals, and arrested and punished as such.

Thus, year after year, this terrible farce of prevention of inebriety by fines and short imprisonments goes on, and the incurability of the poor victims increase. Crime is increased, pauperism is increased, the most dangerous sanitary conditions are fostered, and the burdens of taxpayers and producers are increased.

The inebriate is always debilitated, and suffers from impaired brain and nerve force. Alcohol has broken up all healthy action of the body.

In prison both the quality and quantity of food are ill adapted to restore or build up the weakened organism.

The hygienic influences of jails and prisons are defective in every respect, and adverse to any healthy growth of body or mind.

The psychological influences also are of the worst possible character. The surroundings and the associates precipitate the victim into conditions of mental despair, from which recovery is difficult, if not impossible.

The only compensation to the inebriate is the removal of alcohol, and in this deprivation the state most terribly unfits him and makes him more and more helpless for the future.

Thus, while false theories are one of the sources from which inebriety is produced, the blundering effort to remove it by penal punishment is an actual factor in increasing and intensifying the disorder.

The treatment of inebriety from a scientific stand-point has passed the stage of experiment, and is supported by a great variety of experience and collateral evidence that cannot be disputed.

Probably the largest class of inebriates in this country are without means of support, and may be termed the indigent and pauper class.

This class, non-supporting and burdensome, should come under legal recognition, and be committed to workhouse hospitals, built for this purpose, preferably in the country, upon large farms and amid the most favorable environment.

These hospitals should be training schools, in which medical care, occupation, physical and mental training, could be applied for years or until the inmates had so far recovered as to be able to become good citizens.

These places would receive the classes who now are sent to jail, and that other class who are neglected until they have passed into the chronic stage and have become inmates of prisons and insane asylums.

A very large proportion of these several classes could be made self-supporting while under treatment, and in many cases be an actual source of revenue. The hospitals would naturally be divided into

two classes. The first would receive the better, or less chronic, cases; the second would have the incurables, and those whose recovery was deemed more or less doubtful. In one case the surroundings and discipline would be more adapted for the special inmates than in the other, but the same general restraint would be followed in each.

In both, recoveries would follow. A large class would be restored to society and become producers. In the second, such cases would be housed and made to take care of themselves, which would be an immense gain to society in economy and safety.

Private enterprise should be encouraged by legislation to provide smaller hospitals for the better class, and for those who would be unwilling, or whom it would be undesirable to compel, to enter public asylums. Here the commitments should be both forced and voluntary, and the restraint combined with the fullest and latest appliances of science for the end to be accomplished, blending seclusion and good surroundings to build up and make recovery possible.

The first step is to recognise the fact that the inebriate, whether continuous or periodic, has, to a greater or less degree, forfeited his personal liberty, become a public nuisance, and an obstacle to social progress and civilization. Second, that he is suffering from a disease which affects society and every member of the community in which he lives, and from which he cannot recover without aid from other sources, making it absolutely necessary that he should be forced into quarantine, on the same principle as the small-pox or yellow-fever patient. This is simply carrying out the primitive law of self-preservation. Naturally, the money to accomplish this shall come from the license revenue, on the principle that every business should provide for the accidents and injuries which follow from it. Railroad companies and other corporations are required to pay damages for the accidents which follow their business, and this is conceded to be justice. But to-day the tax on the liquor traffic is used to support courts and jails, where the inebriate, by fines and imprisonment, is only made worse or more incurable. Thus, literally, the business of selling spirits is increased by the almost barbaric efforts of courts and jails, and every person so punished is made a permanent patron of that business. Against this all the teachings of science and all practical study utter loud protest.

The practical success of work-house hospitals for inebriates is demonstrated in every self-supporting jail and state prison in the country, where the obstacles are greater and the possibilities of accomplishing this end more remote. This can also be seen in asylums for both insane and inebriates, in the various sanitaria and hospitals through the country, where the capacity for self-support and the curability of these cases are established facts.

More than that, these hospitals would relieve society of great burdens of loss and suffering, and the diminution of the number of the inebriates indeed become a practical certainty, the extent of which we can have no conception of at present.

It is impossible, at the present time, to estimate the beneficial results that would follow a systematized plan of thus housing and treating the inebriate, but there are positive indications that its effect would be felt in all circles. One of the great fountain-heads of insanity, criminality, and pauperism would be closed, and a new era would dawn in the evolution of science.

The neglect to study inebriety scientifically, and its influence on public health, has opened the door for an army of quacks, who rush in with secret remedies to drive out this disorder. It is the same old story of credulity, disappointment and loss; a repetition of the blind leading the blind and both falling into the ditch. The failure to study inebriety as a problem in sanitary and medical science is a neglect for which the severest penalties must be paid. These armies of inebriates, who are uncontrolled and practically unknown, infest our communities and are the certain promise of misery, sorrow and loss in the future. The failure to study the conditions and causes which produce inebriety, and remove them, is to increase inebriety, criminality, and pauperism, and all their attendant evils, in the years to come. New asylums and homes will be required to-morrow; new burdens of disease, loss, sorrow and death will follow in the next generation. Thus, the evils we recognize in part, and the burdens we are called to bear, are growing and being cultivated in our midst, and will bear fruit as surely as the oak comes from the acorn.

The public health of to-day and to-morrow depends very largely on the prevalence of inebriety. If we can control and stamp this out, one of the great fountain-heads of criminality, pauperism, and insanity will be closed. If all the efforts of church, state, moral,

ists and quacks could be concentrated along the side of exact science, by a study of the facts, conditions, and laws which control the origin and growth of inebriety, the means and remedies for its prevention and cure would be no mystery. To the student of this subject, the possibilities of preventing and stamping out inebriety are only limited by our want of exact knowledge. Looking over into this unknown realm of sanitary science, we see clearly the same reign of physical laws, the same cause and effect, the same circumstances and conditions which develop insanity, pauperism, idiocy, and literally switch the victim from the main track of growth, development, and evolution, to the side lines of degeneration, disease, and dissolution.

The same germ-forcers are at work here, following lines as fixed and eternal as those which govern the stars.

The influence of inebriety on public health is profound and far-reaching, and within the observation of every one. Its remedy must come from the teachings of accurately-observed facts, and along the line of great natural laws.

An Experiment in Disinfection—How an Epidemic of Pneumonia was Checked.*

By JEROME COCHRAN, M. D., Health Officer of the State of Alabama, Mobile, Ala.

For the past twenty years, ever since the epoch-making treatise by Juergensen in Ziemson's cyclopædia, pneumonia has been more or loss generally regarded as an infectious disease, due to a specific germ. But, so far as I have been able to ascertain, no effort has heretofore been made to check its dissemination by disinfection. Perhaps the reason of this is, that this disease ordinarily occurs only in scattered cases, rarely presenting itself in a grave epidemic form, so that resort to preventive measures has not often seemed to be urgently indicated. Epidemic outbreaks have, however, been occasionally described, especially as occurring in prisons. A very fatal outbreak occurred a few years ago in the Kentucky penitentiary; and in 1888 there was a similar outbreak at the old Shaft prison at Pratt Mines, inhabited by Alabama convicts.

During the present year, 1893, another outbreak, which is the subject of this sketch, occurred at Pratt Mines. It was confined to Prison No. 2, which had a prison population of about 600. At Prison No. 1, about a mile away, with about the same prison population, and with the same general management, there was not a single case. At Pratt City, about two miles away, with a population of about 2,000, there was not a single case. There were also several family residences scattered about in the neighborhood of the prison, which escaped without a single case. Even the officers and guards of the prison who did not sleep in the prison wards, escaped without a single case. In one ward the epidemic was strictly confined to the convicts who slept in Prison No. 2. It was evidently not due to unsanitary influences of the general environment. The prison is a good one, well built, well ventilated, well lighted, and admirably policed.

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* Read at the twenty-first meeting of the American Public Health Association.

These facts suggested the conclusion that the epidemic was caused by a strictly localized infection, that had in some way been brought into the prison; and this conclusion suggested the hope that the disease might be amenable to the influence of disinfection, and the aid of disinfection was accordingly invoked.

The pneumonia made its first appearance in the prison in February, with three cases. In March there were three cases. In April there were twenty-two cases. In May the cases ran up to a total of sixty-five, as follows: The first week in May, fourteen cases; the second week, thirty-one cases; the third week, thirteen cases; the remainder of the month, seven cases, ending the epidemic. Total number of cases during the epidemic, ninety-three. Total number of deaths, thirty, nearly one-third of the cases. This expresses only the primary mortality. After apparent convalescence, several of the cases lapsed into some chronic ailment and finally died, so that the ultimate mortality was more than one-third of the cases.

Concurrently with the outbreak of pneumonia, and strictly confined to the same prison, there was an outbreak of a much milder malady, entirely without pneumonic symptoms, which the prison physicians, for want of a better name, called grippe, although it did not present the characteristic symptoms of any of the recognized varieties of that Proteus of disease. Some of these grippe cases developed into the prevailing pneumonia. Many of them were not of much severity, but twenty-five were severe enough to be admitted to the hospital. This disease disappeared when the pneumonia did. I was, myself, satisfied that it was due to the same cause that produced the pneumonia, and in this opinion I was sustained by Dr. Charles Whelan and Dr. E. P. Riggs, distinguished physicians of Birmingham, who were called to assist me in the diagnosis.

The disinfection was begun on the 14th day of May, the last day of the second week, on which day there were six new cases, and just when the epidemic had reached its greatest prevalence, and was finished in six days for that part of the prison in which the convicts slept. The hospital, a detached building, was disinfected on the 2d of June, and the school-room, which, on account of the unusual amount of sickness, was used as a temporary hospital, was not disinfected until the 21st of June, long after the epidemic had ceased to spread.

After the six days consumed in the disinfection of the prison proper, only seven new cases developed. The period of incubation in pneumonia is not known; but it seems fair to conclude that these seven cases received the pneumonic infection before the disinfection of the prison was finished.

The plan of disinfection was simple, but was carried out as thoroughly as possible. The prison consisted of three sections. While the disinfection was going on in one section, the convicts belonging to that section were crowded into two other sections. The mattresses were taken off the bunks and stripped of the mattress cases, and these, together with the blankets, were scattered over the floor. Then, by means of a force-pump and a long hose-pipe, the ceilings, the walls, and the floors with their contents were deluged with a solution of bichloride of mercury, one to the thousand, until it stood in puddles and ran in rivulets on the floors. The mattresses, blankets, etc., were turned over, so as to be wetted on both sides as thoroughly as possible. If I could have been assured that the mattresses were wetted through and through by this process, I might not have thought it necessary to resort to other means of disinfection; but as they were half cotton, I could not count on the thorough penetration of the disinfecting fluid. Besides, I have more confidence in the disinfecting power of heat than I have in the disinfecting power of bichloride.

The mattresses, blankets, etc., were therefore put into large steam chambers, which had been constructed for the purpose, and steamed for six hours, after which they were taken out and dried. In the meantime the disinfected wards were thoroughly scrubbed out and whitewashed, and fitted up so that they could be occupied the next day. The convicts, before they were returned to their old quarters, were required to take a bath and put on clean clothes.

It is necessary to state that my suspicions were vehemently directed against the mattresses, and I was specially anxious that they should be disinfected with the utmost thoroughness. It will not do to place too much confidence in the apparent results of a single experiment, but in this case the facts are sufficiently remarkable. In one short week a malignant epidemic, assaulted at the period of its greatest prevalence and most rapid increase, went out like a fire under a deluge of water.

The character of the cases in this epidemic deserves description. The prodromata were not marked. The outset was sudden and

very severe. The circulation at the beginning of the attack was greatly obstructed, the pulse at the wrist being hardly, and sometimes not at all, perceptible. Subsequently, under the use of stimulants, the pulse to some extent revived, but remained feeble, and soon became very rapid. The temperature in the majority of the cases was from 103 degrees to 104 degrees Farenheit, but in some cases reached 105 degrees and 106 degrees, and in one case rose to 107 degrees. The feeling of prostration and debility was intense. The physical symptoms of croupous pneumonia were not well developed. Crepitant râles were absent. There was very little cough, and very little of the characteristic red expectoration. As we have seen, the mortality was very high.

The post-mortem appearances were quite remarkable, and a post-mortem examination was made in every fatal case. In most of the fatal cases both lungs were involved. The consolidation often began in the central parts of the diseased lungs, and gradually extended to the surface, so that a slice from the surface would easily float in water, while a slice deeper down would sink like lead. The most remarkable characteristic, however, in the pathology of the disease, was the universal presence, in the fatal cases, of ante-mortem heart-clots. These were found in both sides of the heart, although most fully developed, perhaps, in the right side. They extended from the cardiac chambers into the larger arteries,—aorta pulmonary, etc.,—sometimes to a distance of several inches. There was no question that the heart-clots were ante-mortem. They were firm, white, organized into layers, and quite tough, the largest and firmest heart-clots I have ever seen. Strange to say, the presence of these immense clots gave rise to no distinctive physical symptoms.

Apropos of heart-clots, Osler, one of the latest authorities, states that heart-clots are very rare in pneumonia.

In the presence of such a complication, all treatment was utterly inefficient.

Of course the question may be raised whether this was an outbreak of croupous pneumonia of malignant type, or whether it was a distinct cardiac and pulmonary malady.

SEWAGE DISPOSAL IN OBERLIN, OHIO.

[The land treatment of sewage has repeatedly been recommended by the State Board of Health of Maine in its reports and otherwise. The following paper, which is a part of the Report of the Commissioners of Sewers of Oberlin, Ohio, under date of July 1, 1894, is herewith presented for the reason that it illustrates how a system of sewage disposal so well adapted to the needs of some of our villages and smaller cities, and to some of our large hotels and manufacturing establishments, may be carried out in an economical way. We republish it through the courtesy of Mr. W. B. Gerrish, City Engineer of Oberlin.—A. G. Y.]

The Sewer System of Oberlin.—The village of Oberlin is a college town, and distinctively a college town. There are no manufactories and none are desired. The character of the people may be judged from the fact that there are no saloons in or around the town. The population is about 4,400, including 1,200 or 1,500 students.

The ground is very level—two feet contours hardly make a showing—and the sewage in the north part of the town had to be drawn against the grade of the street; so that the outlet of this district was seventeen feet deep at one point. The soil is an impervious clay. Through the town there flows a small stream which is dry through the summer months, except for whatever surplus there may be in our water supply; and into this stream any sewer system must discharge.

The storm water has been very well provided for by means of ditches, and a few storm water sewers already constructed.

There had been a growing demand for a sewer system ever since the water works were built in 1887. This began to assume shape in 1891, when the city engineer was employed to make a topographical map of the town and valley of Plum Creek, besides

establishing monuments at street intersections which would serve to guide street work at least.

Then came the matter of deciding upon which system of sewerage to use, and Mr. H. F. Dunham, of the firm of Dunham and Paine, was called for advice. He recommended a modified combined system. Col. George E. Waring, Jr., was also called, and he recommended the separate system and purification by irrigation. Outline plans of the two systems were prepared and approximate estimates made of their cost.

It was the unanimous decision of the committee of citizens that the separate system was the one best adapted to the town. The principal reasons leading to the decision were as follows:

1st. The effluent must be purified.

2d. The village will not be so large within many generations, that the surface water cannot be provided for by the present means.

3d. The poverty of the village; the tax duplicate being only one and one-fourth million of dollars.

4th. The village being all residence property, with no elevators or manufactories, the amount of sewage would be very small.

In the spring of 1892 an election was held on the subject of issuing $12,000 in bonds for the trunk sewer and a sewage farm, and the vote was favorable. The college contributed $1,500 for the purpose, as their property is not taxable. During the campaign a mass meeting was held and a stereopticon was very useful in showing the proposed plan and some of the details.

The trunk sewer follows the valley of Plum Creek and one of its branches, only about 700 feet being in a street. It consists of 1,360 feet of eight inch pipe on a grade of .36, 790 feet of ten inch pipe on a .22 grade and 8,650 feet of eighteen inch pipe on a .13 grade. The amount paid the contractor was $8,160.

The upper end of the eighteen inch line is below the grade of the creek and is connected with it by a branch which can be opened for flushing when water is running in the creek. As the sewer passes through fields, the surface was very uneven, running from five feet fill, to reach grade, to eighteen feet cut.

Near the lower end it was necessary to cross the creek in order to reach the disposal field. The grade was 8.5 feet above the creek—well out of the way of high water. An inverted siphon for a crossing was the first thought, but they are frequently a source of annoyance, and would prevent the delivery of the sewage in as

fresh a condition as was desired. So it was decided to cross on grade with iron water pipe arranged on the cantilever principle, a pipe being centered on each of two piers and another hung between them, the balance being maintained by one length on each end of the three already in.

The piers are 2.5 feet square, set with a corner up stream. The pipe was wrapped with hair-cloth and boxed. The cost was much less than an inverted siphon, and it is very much more satisfactory.

There are now 150 connections in use, including the college dormitories, and there are 50,000 gallons of sewage running daily.

The 30,500 feet of district sewers were built in two and one-half months last fall. These consist of 25,000 feet of 6-inch pipe on a .4 or .5 grade, the former being used at the upper ends where the efficiency of the flush tanks will be greatest, and 5,500 feet of 8-inch pipe on .4 grade. There are 23 Rhodes-Williams flush tanks used.

A subsoil drain of second grade vitrified pipe was laid beside all the district sewers. The drain pipes were four inches, six inches and eight inches in size, and discharge into the creek at the nearest available point. The subsoil drains are laid through the man-holes, and by breaking the seal of a T can be inspected at any time.

The average cut of the district sewers was 8.2 feet, and the cost, exclusive of engineering, was $17,700, or about $3,000 per mile. Whenever cellars are to be drained, a separate 3-inch pipe, with cement joint, is laid from the house and connected with the subsoil drain through broken stone.

Before any of the sewers were accepted, wooden balls, weighted to reduce their buoyancy, were passed through them all, a flush of water being used to propel the ball. A 5-inch ball was used in the 6-inch pipe, 7-inch ball in 8-inch pipe, 8 1-2 inch ball in 10 inch pipe and 16-inch ball in 18-inch pipe. These showed a number of cases where pipe had been broken through carelessness, and a good many cases where the swab had not cleared the inside of pieces of cement, which would cause trouble if left.

An arbitrary rule was used in locating specials, by which 95 per cent. of all specials can be found with only a tape.

The lots are very wide, usually 5 or 6 rods, but there is no regularity about them, so a Y was placed every 50 feet. All streets are supposed to be divided into 100 feet stations, starting from the monument at the beginning of the street, and the Ys were placed

at these stations and half stations. When the pipe laying was four feet from a station a Y was put in turning to the right, then one to the left and then a T at the station. The Ts at the even stations being extended to within four feet of the surface. Whenever the Y did not come where wanted, another was added and the location noted.

Plumbing.—After taking great pains to see that the sewers were properly built, it was the care of the commissioners of sewers that all the good effect should not be destroyed by defective plumbing.

An ordinance and specifications were prepared, which prescribe in general as follows:

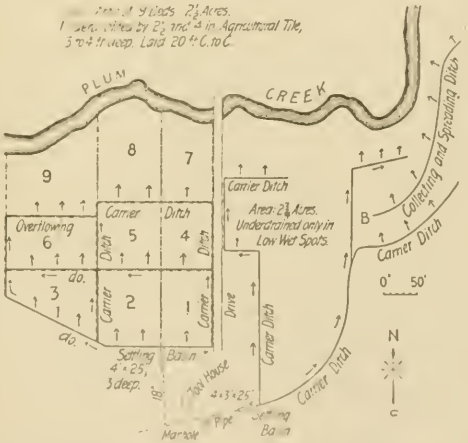
All plumbing and sewer building must be done by competent workmen who give a $500 bond as a guarantee.

House connections are 4 inch vitrified salt glazed sewer pipe with Portland cement joints, laid on a fall of not less than 1 in 48.

All plumbing inside of house is of iron or lead pipe with caulked joints, and tested with water pressure or 15 pounds air pressure.

The method of trapping and back venting, size of pipe, etc., are all carefully described.

All work connected with the sewer is inspected before it is covered.



The Sewage Farm.—The twenty acre field bought by the village for sewage purification purposes is one-half mile from the corporation line and cost $1,500. The field is divided near the middle by Plum Creek. The ground on the north and next the highway

being at too great an elevation to receive the sewage by gravity, shade trees have been set out and it will be used for park purposes.

The two acres shown in the plate on the west side of the drive, have been under-drained with two and one-half inch and four inch agricultural tile, placed three to four feet deep and twenty feet apart. This tract is divided into nine areas by means of small ridges one foot high, shown in the map by broken lines. The sewage is conveyed to the different areas by means of carrier ditches, and the water is spread on the areas by overflowing the sides of the distributing ditches.

The ditches are made by running a deep furrow with a plow and then cleaning and trimming with a shovel. The flow is changed in the different ditches by small dams of a few shovelfuls of earth. Three areas are seeded to alfalfa, three to Italian rye grass and three are planted with sweet corn and other garden vegetables.

On the two and three-fourths acres east of the drive no grading has been done. The land was left in meadow and the sewage is conveyed to different parts of it by small carrier ditches. By damming the ditches at various points the ground just above is overflowed. The point of distribution is changed every day.

The ditch A. B. is an intercepting ditch to catch the flow from the upper ditch and take it toward A. to spread again.

No tiling has been done on the part of the field east of the drive, except a few hundred feet to drain low places. At the ends of the two outlets are settling basins in the earth 4x25x3 feet deep, covered with boards. A board at the top, dipping a few inches into the sewage, retains the floating matter. Once a week the sludge is pumped into a portable tank, hauled to the rear of the field and spread upon the grass or upon barren land and plowed under. An Edson diaphragm pump is used with a four-inch suction from a defunct fire engine. Every place touched by the sewage or sludge is marked by the most luxuriant growth of grass.

There is ten feet difference in elevations between the grade of the sewer and bottom of the creek. The upper carrier ditches follow the foot of a hill.

The soil in the upper part of the irrigated area is clay with numerous strata of gravel, while the lower portion is a sandy loam, it having all been worked over by the creek.

The cost of the sewage farm has been as follows:

6,000 feet of agricultural tile, laid	$256 00
Tool house	55 00
Grading and incidentals	166 00
Pump and tank	42 00
Cost of labor and material	$ 519 00
Add land	1,500 00
Total, including land	$2,019 00

We are at present handling 50,000 gallons per day on the 2 3-4 acres which are tiled, and could probably handle 80,000 gallons per day on the same area.

The effluent from the east part of the field where the sewage merely runs through the grass, is clear and sparkling, and has a reduction in organic matter of nearly 70 per cent. There is an odor, which reminds one of dishwater, directly over the sewage as it is spread out, but 100 feet away no odor can be detected.

Ideas regarding filtration have been revolutionized during the past few years, and this has mainly come from the work of the experiment station of the Massachusetts State Board of Health, located at Lawrence, Mass. It was formerly believed that filtration was merely a straining process, but it has been proved at Lawrence that filtration conducted intermittently brought about a complete transformation of the organic matter into its inorganic compounds. This is largely accomplished by the nitrifying bacteria. We hear so much about the bacteria of disease that we forget about the bacteria which perform useful offices and are essential to make this world habitable. These bacteria of nitrification are of the beneficient variety and aid in the transformation of the organic matter into its harmless inorganic compounds.

One of the essential features of filtration is intermittent use; i. e., stopping the flow of water upon the filter and allowing the air to penetrate the filter. There is a constant improvement in the work done by the filter until the colonies of bacteria have become established, which are just sufficient to dispose of the organic matter which is regularly supplied.

In time the water from the filters becomes so pure as to be drunk by the scientists who have charge of them. In the April number of the Century Magazine, Col. Geo. E. Waring, Jr., speaks of how he and a large pary of engineers "drank freely of the pure

and sparkling outflow of the underdrains of the Gennevilliers sewage fields." It is upon these fields that the sewage of Paris is turned.

It is intended that the field at the end of the sewer shall be an attractive place. The grounds have been cleared of underbrush, the trees have been trimmed, and over 200 young whitewoods, maples, and elms have been set out, and anyone wishing a walk for recreation will find it a pleasant place to visit.

In the following table is given the results of the analyses made, which will throw light on the work accomplished at the sewage farm.

The effluent given in 3 and 7 was taken from the seventh line of tile from the west side of the field.

The effluent in 10 was taken from the west line of tile on Monday afternoon, when the worse sewage is running.

Effluents 17 and 19 were taken from the east side of the field where the sewage had merely spread out over the meadow land.

The test for "oxygen consuming power" is measuring the amount of oxygen consumed by the organic matter as obtained by the addition of permanganates; while this does not show all the organic matter present, it serves for comparing the relative amount present in different samples.

Comparing the albuminoid ammonia in 4 and 8 with that in 13, 14 and 15 it will be seen that the creek water is better now than it was before the sewage farm was established. This would be a natural result because formerly all the sewage of the town found its way to the creek without any purification. The excess of free ammonia shows the breaking up of albuminoid ammonia into nitrites, nitrates and free ammonia.

The increase in chlorine in the creek below the farm comes from the salt in the sewage, and is a harmless addition. The removal of so large a per cent. of chlorine by the filter beds is very unexpected, but other analyses have confirmed this result.

The "total solids" is obtained by evaporating a portion to dryness and weighing, then burning and weighing again. The loss being the organic and volatile portion and the balance being mineral.

Comparing the percentage removed, it will be seen that different lines of tile remove different amounts, and even the same line will vary at different times. There was a heavy shower four days previous to collecting 5 and 8 and that will largely explain the reduction in "total solids" over 1 and 4.

Parts per 100,000.	Oxygen-consuming power.	Per cent. removed.	Free ammonia.	Per cent. removed.	Albuminoid ammonia.	Per cent. removed.	Nitrous acid.	Nitrates.	Chlorine.	Per cent. removed.	Total solids.	Mineral matter.	Organic and volatile.	Per cent. organic and volatile matter removed.	Analyst.
1. Plum Creek water above sewer farm, June 20, '94	1.02	..	.026	..	.034	..	.001	.....	3.52	..	51.6	34.8	16.8	..	Prof. C. C. Howard.
2. Sewage, June 20, '94	7.92	..	1.320	..	.680	..	None ..	.....	8.64	..	112.8	62.4	50.4	.	"
3. Effluent, June 20, '94	2.16	73	180	86	.090	87	.005	.....	4.44	49	71.6	50.2	21.4	57	"
4. Plum Creek water below sewer farm, June 20, '94	1.31	..	.058	..	.064	..	.010	.....	3.56	..	57.4	38.2	19.2	...	"
5. Plum Creek water above sewer farm, July 2, '94	.96	..	.012	..	.024	..	.001	.....	1.52	..	36.4	25.6	10.8	.....	"
6. Sewage, July 2, '94	3.60	..	.920	..	.320	..	None ..	.....	5.00	..	85.2	54.2	31.0	.....	"
7. Effluent, July 2, '94	1.84	49	.090	91	.048	85	.010	.....	3.00	40	59.6	43.4	16.2	48	"
8. Plum Creek water below sewer farm, July 2, '94	1.21	..	.036	..	.030	..	.015	.....	2.16	..	42.4	30.0	12.4	.....	"
9. Sewage, May 15, '94	11.135	..	2.6256	..	1.608	..	.....	.....	.....	..	.....	...	....	. ....	I. W. Mattison.
10. Effluent, May 15, '94	.51	95	.0918	96	.03432	98	.....	.....	.....	..	....	...	....	.....	"
11. Plum Creek water above sewer farm, Apr. 18, '94	.98	..	.01992	..	.0480	..	.0033	Strong traces	1.80	..	.....	....	...	.....	"
12. Plum Creek water below sewer farm, Apr. 18, '94	.9825	..	.07488	..	.05232	..	.004	Traces.....	2.20	..	.....	....	....	.... .	"
13. Plum Creek water, April 15, '86	.....	..	.020	..	.0784	..	.....	.....	.64	..	17.1	....	....	.....	Prof. F. F. Jewett.
14. Plum Creek water, July 11, '92	.....	..	.033	..	.2100	..	Traces.	Traces	.96	..	.....	....	....	.....	I. W. Mattison.
15. Plum Creek water, August 8, '92	.....	..	.0166	..	.0775	..	Trace ..	.20	1.49	..	.....	....	....	.....	"
16. Sewage, May 8, '94	4.895	..	.....	..	.....	..	.....	.....	.....	..	.....	....	...	.....	"
17. Effluent, May 8, '94	1.545	69	.....	..	.....	..	.....	.....	.....	..	.....	....	....	.....	"
18. Sewage, May 9, '94	7.72	..	.....	..	.....	..	.....	.....	.....	..	.....	....	....	....	"
19. Effluent, May 9, '94	2.54	67	.....	..	.....	..	.....	.....	.....	..	.....	....	.	.....	"

The Sewage Disposal Problem in American Cities.*

By ALLEN HAZEN, Chemist in Charge Lawrence Experiment Station, Massachusetts State Board of Health, Lawrence, Massachusetts.

One of the striking features of the sanitary development of American cities is the very rapidly increasing number of places which, for one reason or another, are treating in some way their sewage. It is not so very many years since there was hardly a sewage purification plant in the United States, while at the present time there are some thirty municipalities in a dozen different states which give their sewage a more or less thorough treatment. Of these a number are in the far West, where the sewage has a commercial value for irrigation, which has probably been considered quite as important as the sanitary advantages secured by the treatment, but the greater number are in the East, where a dense population and increasing desire for cleanliness in the waters of streams and lakes, and particularly in water supplies, has brought to an issue problems which as yet have scarcely received the attention of the inhabitants of the less thickly settled states.

Strictly speaking, there are two sewage problems, which are entirely different in their natures, although the same remedies may often be applied to both. There is, first, the pollution of rivers and lakes to such an extent that they produce a nuisance to the people who live upon their banks, and second, the pollution of water supplies by sewage. These problems are entirely distinct, and failure to sharply discriminate between them has been responsible for not a little misunderstanding in regard to methods of sewage disposal.

The first case is often that of a city upon the banks of a small river, which becomes so reduced in volume in dry weather that the

* Read at the twenty-first meeting of the American Public Health Association, Chicago, October 9-14, 1893.

sewage may fairly be said to be the predominating element in its composition. Up to a certain point, rivers are capable of taking sewage without causing a serious nuisance to the people who live upon their banks, so long as they do not drink from them, but when this quantity is passed, deposits are formed, decomposition sets in, and the stream is rendered foul in appearance and objectionable in its odor. The exact quantity of sewage which can be mixed with water without causing a nuisance varies with local conditions, and can only be approximately estimated, but so long as the limit is not passed, and with bodies of water not used for drinking, the disposal of sewage by turning it into such water is entirely unobjectionable, and by far the most satisfactory method possible. Thus the construction of purification works for the sewage of the cities on the lower Merrimac, below the points where it is used for public water supplies, would be sheer waste of money much needed for other public improvements.

When, however, the limit is passed, and the sewage becomes so large a proportion of the volume of the water with which it mixes that an actual nuisance is produced, then a remedy is demanded. The necessary purification of the sewage consists in this case in the removal of the organic matters of the sewage, which are the sole cause of the decompositions and the offensive appearances and odors which accompany them. So long as the sewage does not find its way into drinking water, the removal of the bacteria from the sewage is a matter of no consequence whatever. If the germs of disease in a river were capable of affecting those who only live near it, it is not hard to think of parts, at least, of cities which would have been entirely depopulated long ago.

But in the second case where the sewage of a town is entering the public water supply of a neighboring town, or, worse yet, its own supply, the problem is entirely different. The removal of the organic matters of the sewage becomes a secondary, although still an important matter, while the removal of those germs of disease, which would otherwise work such mischief among the consumers of the water, becomes the one all important point.

The problems of the first class have, perhaps, received more attention than those of the second, because a black, dirty stream, giving off sulphuretted hydrogen, is more obviously a nuisance than is a polluted water supply, the relation of which to the health

of the community is too often but imperfectly realized, even by those having such matters in direct charge, and much less by the mass of voters and taxpayers, whose support must be obtained before any expensive improvements are possible.

When, however, we think of the compactness with which great sections of country in the neighborhood of large cities are being settled, and the growing difficulty in such cases of securing a water supply, even approximately free from sewage contamination, it becomes apparent that the protection of our water supplies will require the construction of increasing numbers of sewage purification plants, in which nothing short of the complete removal of the bacteria of the sewage will be accepted as satisfactory.

Turning now to the methods of sewage treatment, we may divide them broadly into two classes, the first of which by mechanical means, usually with the aid of chemicals, seeks to remove the grosser impurities from the sewage, while the second, by applying the sewage to land, at once disposes of it, and at the same time often allows a partial utilization of its fertilizing value by the crops which may be grown upon the land.

Of the first class of processes, only those treatments commonly designated as chemical precipitation have shown themselves capable of advantageous application. Chemical precipitation consists briefly in adding chemicals to the sewage which form in it a precipitate which coagulates, and weights the organic matters, which are then allowed to settle out in properly constructed tanks, while the rest of the sewage floats away in a more or less clarified condition. These processes have been extensively used in England and also in Germany and at several places in America. The chemicals employed are varied in different places, but the underlying principle is always the same. The tanks in which sedimentation is obtained are of varied shapes, large, shallow tanks being employed at Worcester, Mass., White Plains, N. Y., East Orange, N. J., and at Canton, Ohio, while the plant which treats the sewage from the World's Fair grounds, and is itself an exhibit, is provided with high cylinders, through which the sewage slowly rises, leaving the precipitate upon their specially prepared bottoms.

Chemical precipitation at best is only able to remove the bulk of the suspended matters of the sewage, with a small part of the soluble matters and a certain proportion of the bacteria. The effluents

obtained are much less likely to produce a nuisance in streams than is raw sewage, and in those cases where the purity of a drinking water is not involved the result may be quite satisfactory.

The possibilities of sewage treatment by chemical precipitation are substantially the same the world over; local conditions are only of secondary importance. It is otherwise with the land treatments. With them the local conditions are of controlling importance, and make the general problem far more complex than would otherwise be the case. Land treatments have been long and extensively used in Europe, and some general conclusions have been deduced from the results there obtained, which are useful for corresponding conditions in this country. The experiments undertaken by the Massachusetts State Board of Health at the Lawrence Experiment Station some six years ago indicated that the local conditions in Massachusetts would allow the treatment of sewage upon land often with more favorable results, both as to quantity of sewage treated and quality of effluent obtained, than had been supposed to be the case from a study of European practice.

The results of those experiments have not only shown the superior natural advantages for sewage purification existing in Massachusetts, but they have indicated arrangements of materials and methods of preparation of the surface of land, which allow even better work than would otherwise be possible. They have also led to a better understanding of the underlying principles which enable us to make calculations in regard to the capacity of and results to be obtained from the various materials and combination of materials available at different points, and in this way avoid the useless expenditure of money and the disappointing results almost sure to follow the construction of badly arranged works or the use of unsuitable materials.

The practical value of the experimental results obtained at Lawrence has been amply demonstrated by the application of the methods found most useful to the arrangement of sewage fields for the purification of the sewage of several towns of considerable size. Among these the South Framingham filter beds were the first to be put in operation some four years ago. The sewage is pumped on to a field of coarse porous sand, suitably arranged to receive it, and rapidly filters away and becomes purified to such an extent that the undiluted effluent from the underdrains is preferable as a beverage to some public water supplies now in use. The costs, both of construction

and operation of this plant, have been very moderate, and are not to be compared for an instant with the advantages of diverting the sewage of ten thousand people from Boston's water supply. Works more or less like those at South Framingham are also in use at Marlborough, Gardner, and other smaller places in Massachusetts, while Brockton has just completed a larger plant, built upon the same general plan.

If the kinds of soil which have proved themselves so useful in Massachusetts were everywhere available, we might well congratulate ourselves that the sewage problem had at last been solved, and we should then waste no time upon more costly and less complete methods of purification. But unfortunately, the open, sharp-grained sand of New England is a rare article in large sections of our country, and for those places where it is lacking the experiments of the Lawrence Experiment Station have only a suggestive value. They may indicate in some measure the methods likely to yield the best results, but they do not give any accurate idea of the results which can be obtained with an entirely different class of materials from those with which the experiments have been made.

We can infer from European experience that many, perhaps most of these inferior materials are capable of purifying sewage at rates much lower than those followed in Massachusetts; but how much lower until additional data are secured, it must be more a matter of guess-work than of conservative calculation. It has been our experience that the terms used to designate different classes of materials have such decided local variations in their significance that it is not safe to depend upon verbal description in estimating the values of materials, and it has been an important part of the work at the Lawrence Experiment Station to develop methods of examination of materials, by means of which their physical properties can be determined with some measure of accuracy. In this way we have been enabled to classify materials, and within the limits covered by the experiments to make reliable estimates of their power of sewage purification.

In those places where the open sands for intermittent filtration, as practised in Massachusetts, are not available, and for one reason or another the land treatment at lower rates, so commonly used in Europe, cannot be applied, we can still use chemical precipitation. This was the condition of affairs on the World's Fair

grounds, where the small area of extremely valuable land available for the sewage works was totally unfit to receive the quantity of sewage which it was desired to purify before turning it into Lake Michigan. The chemical precipitation plant, which is now doing the work, perhaps purifies more sewage, in proportion to the space it occupies, than any other plant in existence doing corresponding work. The entire area covered is hardly more than a quarter of an acre, and the sewage treated, sometimes exceeding three million gallons daily, would be sufficient to flood the entire area over thirty-five feet deep in a single day.

It is impossible by any combination of chemicals to secure a purification which approaches, even remotely, the result obtained by land treatment, but when the problem is simply to keep the water into which the sewage flows reasonably clean, the result, with careful manipulation, is quite satisfactory. When, however, the treated sewage finds its way into the sources of a public water supply, the effluent produced by even the most complete chemical precipitation cannot be regarded as an entirely unobjectionable addition, and such water should be farther treated by filtration before use. Still, even in this case, the treated sewage is much less objectionable than raw sewage, and the removal of over a thousand tons of solid filth from the World's Fair sewage during the past month, while it has not protected the water cribs from the vastly larger volume of untreated sewage from the city, has at least materially reduced the contribution from the park.

The Filtration of Water.*

By CHARLES J. FOOTE, M. D., Director of the Bacteriological Laboratory of the Medical Department of Yale University.

When it is considered that there is no systematic inspection of the water supplies of Connecticut and that a private inspection has shown a contamination with sewage of the water supplies of two of the largest cities of the state, no apology is needed for a short paper on the filtration of water.

A safe water for drinking purposes can be obtained either by boiling or by filtration. The former deprives water of its sparkle and renders it insipid. Boiled water must be cooled before used, and during the cooling process may become contaminated with atmospheric germs unless placed in a sterilized flask with a sterilized cotton stopper, or in some other equally efficient receptacle.

A good filter, however, would furnish the most satisfactory solution of the problem.

A great variety of substances have been used for household water-filters, many of which, by filtering out the larger particles of organic and inorganic matter give the water a fallacious clearness. Cloth, sand, spongy iron, animal charcoal, asbetos, infusorial earth, and porcelain are the substances which have been most used for filters. Only the three last substances can claim any attention for purposes of filtering bacteria out of water, and even they have their limitations.

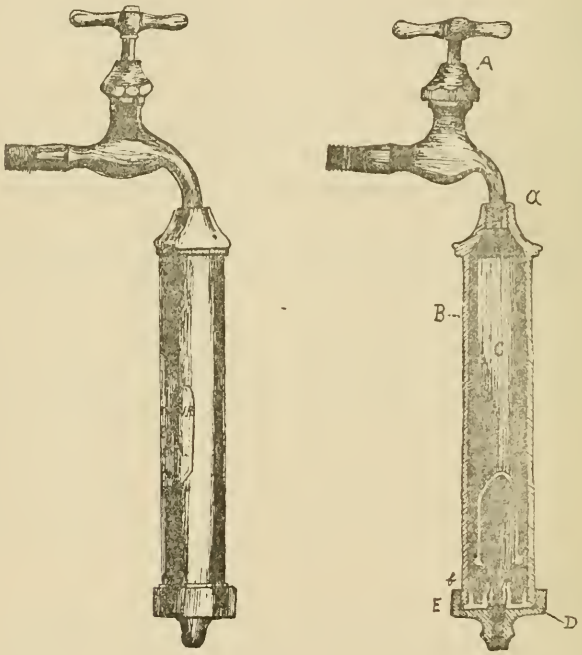
It must always be remembered that a filter furnishes, in warm weather, or in a warm room, the three essential conditions for bacterial growth, namely, abundant dead organic matter, moisture and warmth; and that thus it actually becomes a favorable breeding place for microörganisms. It has frequently been proved that water coming from all ordinary filters has many more bacteria in it than it had before it entered the filter. Currier has shown that sponge filters which had been in use only twenty-four hours, fur-

* From the 15th Annual Report of the State Board of Health of Connecticut.

nished a water containing five hundred times as many bacteria as were in it before filtration.* Therefore most filters are not only useless but are an actual menace to health. In fact epidemics of typhoid fever have been traced to infected filters.

Inasmuch as the Pasteur-Chamberland filter furnishes at present the most practical way of obtaining a sterile water, and seems to deserve a special claim to our attention, some experiments were undertaken by me to determine the value and limitations of porous porcelain as a filter.

The Pasteur-Chamberland filter is made as represented in the annexed woodcut.



It consists of a hollow porcelain cylinder, one end of which is closed. The other end tapers into a small nozzle. The porcelain part of the filter is introduced into a metal framework; the lower part of the cylinder rests on a rubber packing to prevent the water flowing around the porcelain. The porcelain itself is about one-eighth of an inch thick, while the cylinder measures one and one-

* Med. News, April 20th, 1889, p. 430.

eighth inches in diameter and nine and one-half inches in length. The porcelain is given this shape so as to furnish as large a surface as possible to the water, since water filters through it quite slowly.

Experiment 1. On September 22, 1891, the Pasteur-Chamberland filter, of the construction above described, was connected with the water-tap of the laboratory and allowed to run continuously until February 19, 1892. The water pressure during this time was tested by a mercury manometer, and is recorded below in inches. A record was also made of the amount of water filtered in five minutes. Before placing the filter in position, the porcelain portion was sterilized by dry heat, while the metal and rubber portions were sterilized in boiling water.

In testing the filtrate a certain amount of the filtered water was received directly into a sterilized test tube, which was immediately plugged with cotton. A few minutes later one cubic centimeter of this filtrate was added with sterilized pipette to some nutrient gelatine and the mixture poured into a Petri dish. Two plates were made in each case. Control experiments were made at the same time with unfiltered water.

A source of error is possible in this method. When the water has been running several days it comes slowly, drop by drop, and the test-tube must be held some time under the filter to obtain the requisite amount of water, and thus contamination from the air is possible.

EXPERIMENT No. I.—Pasteur filter sterilized, both metal cap and porcelain tube—started running September 22, 1891—4 P. M.

Date.	Height of mercury.	Number of c. c. filtered in five minutes.	Number of Bacteria in 1 c. c.	
			In filtrate.	In unfiltered water.
Sept. 22, 4.30 P. M.	4 feet	400 c. c.	(1) sterile. (2) sterile.	Many bact. plates entirely liquefied on 2d day.
Sept. 23, 4 P. M ...	3 ft. 8 in...	29 c. c.	(1) sterile. (2) a few colonies.	Both plates completely liquefied on 2d day.
Sept. 24, 12 M	3 feet.....	17 c. c.	(1) sterile. (2) many colonies.	Both completely liquefied on 2d day.
Sept. 25, 11 A. M..	3 ft. 2 in...	16½ c. c.	(1) sterile. (2) sterile.	Both completely liquefied on 3d day.
Sept. 26, 11 A. M..	1 ft. 10 in..	9½ c. c.	(1) a few colonies. (2) a few colonies.	Both completely liquefied on 3d day.
Sept. 28, 11 A. M.	3 ft. 2 in...	11 c. c.	(1) sterile. (2) 3 colonies	Both completely liquefied on 3d day.
Oct. 16	3 ft. 5 in...	.....	(1) sterile. (2) sterile.	350 colonies on plates.
Dec. 30.....	3 ft. 7 in...	4½ c. c.		
Feb. 19, 1892.....	2 feet.....	3 c. c.	(1) sterile. (2) sterile.	72 colonies in unfiltered water.

In this experiment it is noticeable that the number of bacteria in the filtrate do not seem to have any relation to the water pressure, and this statement is borne out by the work of other investigators. It is also noticeable that the number of bacteria in the filtrate do not seem to progressively increase, as has been claimed by other investigators.

Experiment II. In this experiment it was determined to simplify the manipulation and thus diminish the chance of infection from external agencies. It was found that eight drops from the filter equaled one cubic centimeter of water. Sixteen drops or two cubic centimeters, were permitted to flow into a test tube of liquified gelatine, and this was immediately made into an Esmarch tube. Moreover, before use the nozzle of the porcelain portion of the filter was carefully plugged and covered with cotton and then sterilized by dry heat. The cotton was kept on until just before the introduction of the porcelain into the metal frame. Just before placing the porcelain in position, the upper part of it was coated with the sticky liquified gelatine culture of the *B. prodigiosus*.

As the *B. prodigiosus* was not found in the air of the laboratory, its presence in the filtrate would indicate either a passage of the bacteria through the porcelain or passage around the rubber packing of the filter.

EXPERIMENT No. 2.—October 24, 1892.—Filter sterilized as before—Esmarch tubes made—water filtered directly into gelatine—porcelain daubed with liquid culture of *B. prodigiosus*—lower part of filter kept covered with sterile cotton until introduced into metal fittings—16 gtt.=2 c. c. in each tube.

Date.	Height of mercury.	Number of c. c. filtered in 5 minutes.	Number of Bacteria in 2 c. c. of filtrate.
October 24	3 ft. 5 in	85 c. c.	(1) 3 colonies (2) 10 colonies (3) 3 colonies Prodigiosus.
October 25	3 ft. 3 in	25 c. c.	(1) Sterile. (2) Sterile.
October 26	2 ft. 5 in	12½ c. c.	(1) Sterile. (2) 1 colony (not prodigiosus).
October 27			(1) 1 colony (2) 1 colony Not prodigiosus.
November 9			(1) Numberless green, iridescent colonies, slowly liquefying. (2) Same.
November 22		5 c. c.	(1) 50 or more colonies. (2) Same.
December 2			(1) Many solid white colonies. (2) 10 solid colonies, as above.

In this experiment the filtrate taken soon after the water was turned on showed the presence of the *B. prodigiosus*, and this alone. No colonies of the *B. prodigiosus* developed from the filtrate taken later than the first day, therefore the bacteria seem to be carried through the first rush of water.

To determine whether the *B. prodigiosus* came through the porcelain or was carried though the rubber packing, a filter was extemporized, fixed in such a way that any leaking around the packing could be observed. This filter was made as follows: A piece of a glass tube, one and one-half inches in diameter and ten and one-half inches long, was plugged at both ends with rubber stoppers. Through the upper rubber stopper a small glass tube was introduced, which communicated with the water tap by a rubber tube; in the

lower rubber stopper a round hole was cut, through which the porcelain cylinder was pushed as far as the glazed portion. This apparatus was then fixed securely on a wooden frame to prevent the pressure of the water forcing out the rubber stopper. The porcelain cylinder had been sterilized by dry heat and the other portions of the filter with boiling water. Just before putting in the upper stopper, the porcelain was smeared with a prodigiosus culture. The filtrate obtained from this filter was examined and proved to be sterile. There was no leaking around the rubber stopper. My conclusion, therefore, is that the rubber packing around the porcelain tube of a Pasteur filter is not reliable. Whether the packing of all the Pastêur filters are of the same pattern, I do not know, but the woodcuts in the catalogues of certain German manufacturers indicate a different construction from those made in this country.

The conclusion seems to be fairly well established by previous investigators that filtration through porcelain, provided that the water actually goes through the porcelain and not around it, furnishes a sterile water for a few days only; and that the length of time that the filter furnishes sterile water depends on the temperature of the room where the filter is placed or on the temperature of the water from the tap. Thus Freudenreich has shown that at a temperature of 15° C.-18° C., the filtrate was sterile for 15-21 days, while when the temperature was 22° C., it was sterile for nine days; at a temperature of 35° C., it was sterile for only five days.* Freudenreich's investigations are also valuable since he tested every drop of the water filtered by adding it to a concentrated bouillon.

Water pressure, in contrast with the influence of temperature seems to have no relation to the presence of bacteria in the filtrate. This may be observed in my experiments. Kübler has also shown by experiments carried on without pressure, that bacteria may appear in the filtrate on the third and fourth days.†

The fact that the presence of bacteria in the filtrate does not depend upon pressure, but does depend upon temperature, points to one conclusion, namely, that the presence of bacteria in the filtrate is due to their growth through the pores of the porcelain. To determine this point more conclusively, Smith and Moore have

* Centralblatt für Bakteriologie, Bd. xii, s. 240.

† Zeitschrift für Hygiene, Bd. viii, s. 48.

proved by immersion of the porcelain cylinder of a Pasteur filter in a bouillon culture of the bacillus of hog cholera, and removing the fluid that percolated into the interior, that the bacillus of hog cholera grows through the pores of the porcelain, when kept in a thermostat in from five to ten days.*

We may conclude then first, that the porcelain cylinder of a Pasteur filter should be cleansed once a week at least, by boiling in water for an hour. A simple washing is not sufficient, since when the porcelain is replaced the living bacteria still remain in its pores and come through into the filtrate as soon as the water is turned on; second, that the filter should not be put in a position where it is near a range or any other apparatus giving out much heat, but put in a cold place; third, that a properly constructed filter should be obtained so that there is no chance of a leak around the packing.

* Centralblatt für Bakteriologie Bd. xii, s. 628.

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